The Mining Journal
AND ATMOSPHERIC RAILWAY GAZETTE,

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 548.---Vol. XVI.] LONDON: SATURDAY, FEBRUARY 21, 1846. [Price 6d.

WHEAL LOPEZ MINE, BICKLEIGH.—VALUABLE and EXTENSIVE ASSORTMENT of MINING MATERIALS.—TO BE SOLD, BY AUCTION, by D. H. RAINSSELIN, on Tuesday, the 10th March, 1846, and following days, at WHEAL LOPEZ MINE, Bickleigh, seven miles from Plymouth, all the VALUABLE AND EXTENSIVE ASSORTMENT OF MATERIALS,

lately used in working the said mine.

Comprising a capital 40 ft. water-wheel, with 3 ft. 6 in. breast; a superior 39 ft. water-wheel, 6 ft. breast with iron ring; an excellent water-wheel 9 ft. 6 in. diameter and 9 ft. breast, with drawing machine, &c.; a crushing machine and floor; a set of 3 head stamps and wheel; iron windlas, capstan and beam; sheers and pullies; several hundred fathoms of flat and round rope; about 60 tons of superior iron, in bishops' heads; bob gudgeons; chairs; staples; strapping plates; rolls; rails and railway saddles; stuffing boxes and gland; H-pieces and clacks; pullies; bucket rods; angle bob; leggerheads; cramps; cylinder case; sweeps, bob chains, and rod plates; rod loops; pullies; round and square rods; wrapping bonds; rod plates; planch pins bolts; castings; rings, &c.; SEVERAL LIFTS OF SUPERIOR 17 in. 15 in. and 10 in. PUMPS; door pieces; wind boxes; working barrels; clacks; matching pieces; several wood pumps; excellent oak and other timber; launders; plank; ladders; roofs of machine houses; saw pit; carpenter's bench; blacksmith's bellows and forges; anvils; vices; screw plates; screwing stock; horse and other tools; iron kibbles; beam and scales, with stand and weights; triangle and blocks; miner's tools; new shovels; a superior THEODOLITE; six bags of nails; 3 cwt. gunpowder; leather; old rope; grinding stones; and a useful assortment of other articles calculated for mining purposes.

The whole of the above being in excellent condition, is strongly recommended to mining agents and others, who may inspect the same six days before the sale, on application to Capt. Edwards at the mine, of whom catalogues may be had; of the auctioneer, No. 1, St. Aubyn-street, Devonport, or of Mr. Boswarva, Sussex-street, Plymouth.

The Plymouth and Dartmoor Railroad runs through the sett, by which a cheap conveyance can be had to Plymouth if any of the materials should be bought for shipment.

Sale to commence each day precisely at Eleven o'clock. An early attendance is respectfully solicited as the lots are numerous and valuable. 1

REFRESHMENTS WILL BE PROVIDED.

1, St. Aubyn-street, Devonport, Feb. 18, 1846.

NEWTOWNARDS LEAD MINE.—TO BE SOLD, BY PUBLIC AUCTION, at the Odd Fellows' Hall, Douglas, Isle of Man, on Thursday, the 12th day of March next, at Twelve o'clock at noon, in lots, ONE HUNDRED and NINETY-ONE SHARES of the NEWTOWNARDS LEAD MINE, in the county of Down, Ireland. This mine embraces the whole of the town lands of Whitespots; has lately been extensively opened, and furnished with sufficient machinery to extend the workings for many years; is now in a remunerative state, with every prospect of immediate further improvement, and consists of 598 shares, held under lease from the Marquis of Londonderry, for an unexpired term of 18 years, from the 1st November last, and a life, now six years of age, yielding a royalty of 1-10th. The youth having a strong constitution, and the families noted for longevity, causes the property to be valuable, and worthy the notice of mining adventurers. 2

HELEN IRON-WORKS, near BERWICK-UPON-TWEED. —This highly desirable IRON FOUNDRY, &c., with its valuable MACHINERY, IMPLEMENTS, BOXES, and PATTERNS, TO BE SOLD, BY PRIVATE BARGAIN.

Applications for plans and catalogues to be made to Robert Guthrie, 159, Fenchurch-street, who will treat for their sale. 3

TO IRONFOUNDERS.—TO BE LET, entry at Whitsunday, the OAK BANK FOUNDRY, on the banks of the canal at the Old Basin, now possessed by the London Vulcan Foundry Company, will BE LET to a respectable tenant, for a term of years, at a moderate rent. It consists of two large moulding shops, two cupolas, an engine of 8-horse power, and is capable of furnishing castings of nine tons weight. There are two good double-power cranes, with a great variety of moulding boxes, core bars, a variety of excellent wheel patterns, engine and machinery patterns, and other foundry utensils; also smithy and wright's shop adjoining.

FOR SALE, AT THE PREMISES,

One new side lever CONDENSING-ENGINE, of 30-inch cylinder and 3-feet stroke, with malleable iron crossheads, crosstails, and parallel motion, substantially and well fitted.
One 4-horse portable CONDENSING CISTERN ENGINE.
One segment fly-wheel, 18-feet diameter, 8¼ tons weight, fitted.
Two heavy clay-mill rollers, finished with table, shafts, and wheels.
One self-acting turning lathe, 18-feet bed—width on the bed 19 inches, and heads 16 in., slide rest as 4 chucks, with apparatus for cutting screws of various pitches—on the construction of Mr. Fox, of Derby.
A condensing steam cylinder, cased, interior diameter 27½ inches and 6-feet stroke, with coupled slide valves, nozzils, cylinder cover, metallic piston, and piston-rod.
Three sugar-mill rollers; driving roller, 3 ft. 10 in. long, 24½ in. diameter, scrap malleable iron gudgeon journals, 8 in. diam. and 11 in. long, square 8½ in. and 10 in. long. The journals of the other two rollers 6½ in. diameter, and 9½ in. long, square 7½ in., and and 10½ in. long. These rollers are 4 ft. 3½ in. long over the flanges, all turned and fitted.
One set of shifting gear, for a crane jib.
A large quantity of Spigot and Faucet pipes, chiefly 4 and 5 in. diameter.
A Bramah pump, for sewing pipes.
Several sets of iron tackle blocks, and a few shifting spannors.
Apply to Mr. Neilson, the proprietor, at Oak Bank.
Glasgow, Feb. 12, 1846. 4

TO BE SOLD, OR LET, SEVERAL valuable VEINS of BITUMINOUS and ANTHRACITE COAL, IRON, LEAD ORE, and FIRE CLAY, lying under extensive estates in the counties of Glamorgan, Carmarthen, and Brecon. The coal and minerals may be easily wrought, at a small expense; they lie within convenient distances of seaport and market towns; and are, to a great extent, workable by level. The South Wales and other projected lines of railway are intended to pass through or near the greater portion of the estates. The property commands eligible sites for the erection of iron-works, and possesses the advantage of having a constant supply of water-power at command.—For further particulars apply to Mr. John Morgan, land and mineral agent, and surveyor, Swansea. 5

COAL WORK.—TO LET, for such number of years as may be agreed on, with entry on the 11th of April next, the well-known COAL WORK of DRONGAN, together with the PASTURE FIELD attached thereto. The work is situated about seven miles from Ayr; the coal is abundant, and of excellent quality; and, as it is very probable that a railway will soon run close to the works, the expense of carriage of the coal to Ayr will be very much reduced.

James Richmond, overseer at Drongan, will show the work and the coal-field; and further particulars will be learned on application to John Donaldson, Esq., W.S., Edinburgh; John Geddes, Esq., mining engineer, Edinburgh; or John Paul, writer, Ayr; with either of whom sealed offers may be lodged, on or before the 17th day of March next. Ayr, Feb. 3, 1846. 6

TO COPPER SMELTERS, AND OTHERS CONNECTED WITH THE COPPER AND BRASS BUSINESS.—TO BE SOLD, BY PRIVATE CONTRACT, the OLD ESTABLISHED and EXTENSIVE WORKS, known as the WHISTON COPPER WORKS, situate at Whiston, near Cheadle, in the county of Stafford, now in the occupation of the proprietors. The works now contain two copper smelting furnaces, a calciner, and a copper refinery furnace, and three furnaces and two calciners, for spelter. There is ample room to extend the works and increase the business to any amount—the site and adjoining land, which will be sold with the works, comprises about 15 acres. A blacksmith's shop, cottage, and office, are attached to the works. The purchaser may have the option of taking to the stock in trade, at a valuation.—Whiston is one mile from the Cauldon Canal, and from the proposed line of the North Staffordshire Railway, now before Parliament, in the immediate neighbourhood of cheap coal, and about 10 miles from the celebrated Ecton Mines, and other copper mines in the same neighbourhood. Within one mile of Whiston is a bed of stone, which has been proved to answer well for the manufacture of glass; and either the present works may be easily converted into a glass manufactory, or one might be built on part of the vacant land.—The premises may be viewed at any time; and for further particulars, or to treat for the purchase, application may be made to Messrs. Wm. Sneyd and Co., at the works, or to Mr. John Nixon, Basford, near Leek.—Feb. 2, 1846. 7

FOR SALE, BY PRIVATE CONTRACT, at TRESAVEAN MINE, in the parish of Gwennap, Cornwall, an 18-inch cylinder STEAM WHIM ENGINE, with brass air-pump and foot valve, cage fly-wheel, &c., in good condition; also a 60-inch cylinder, top, bottom, PISTON and ROD.—For viewing the same, apply to the agents on the mine, and for price and particulars to Capt. Richards, Redruth. Redruth, Feb. 19, 1846. 8

NOTICE TO THE PROPRIETORS AND SHARE-HOLDERS OF MINES, SMELTING-WORKS, &c.

Messrs. MITCHELL and FIELD beg to inform the PUBLIC, that they have REMOVED from No. 5 A to No. 23, HAWLEY-ROAD, KENTISH TOWN, where they have erected a spacious LABORATORY, fitted expressly for the performance of all OPERATIONS CONNECTED WITH MINING.—Practical instruction to gentlemen in Assaying, Mineral Analysis, and Manufacturing Chemistry in general.

Assays and Analyses conducted as usual.

All communications to be addressed to Messrs. Mitchell and Field, assayers, No. 23, Hawley-road, Kentish Town. 9

THE PATENT SAFETY FUSE, FOR BLASTING ROCKS IN MINES, QUARRIES, AND FOR SUBMARINE OPERATIONS.—This article affords the SAFEST, CHEAPEST, and most EXPEDITIOUS MODE of effecting this very hazardous operation. From many testimonies to its usefulness with which the manufacturers have been favoured from every part of the kingdom, they select the following letter, recently received from John Taylor, Esq., F.R.S., &c.:—"I am very glad to hear that my recommendations have been of any service to you; they have been given from a thorough conviction of the great usefulness of the Safety Fuse; and I can quite willing that you should employ my name as evidence of this."

Manufactured and sold by the Patentees, BICKFORD, SMITH, and DAVEY, Camborne, Cornwall. 10

THE PATENT GALVANISED IRON COMPANY call PUBLIC ATTENTION to the following, amongst other GREAT WORKS executed with their patent article:—

The ROOFS of the NEW HOUSES OF PARLIAMENT, at Westminster.
The SLIPS, or SHEDS, for building "first-rates," in the ROYAL DOCKYARDS, at Woolwich, Portsmouth, Deptford, &c. (the latter visible in passing down the Thames, and is an object of great beauty, having a centre span of eighty-two feet). The Timber Sheds, and other buildings, in the Royal Dockyards, are also being roofed and constructed with this fire-proof material.
The BUOYS and other MARINE WORKS of the Honourable Corporation of the Trinity House have for two years been CONSTRUCTED with the Galvanised Iron, which resists effectually the action of sea water.
The celebrated ELECTRIC TELEGRAPHS of Messrs. Cooke and Wheatstone are CONSTRUCTED exclusively with the company's Galvanised Wires, &c.
And this indestructible iron, under all common influences—*viz.*, sea water, saline or damp atmospheres, is admirably adapted for
ROOFING in all climates, being Fire, Hurricane, and Lightning proof, if a continuous communication be formed with the earth by Galvanised Iron spouting attached to the roof.
DOCK-WORK, chain or wire rope bridges, wire fences, fire proof buildings, corrugated doors, shutters, greenhouses, conservatories, and an endless variety of purposes.
Roofs of gas works and chemical manufactories.
Ship-building purposes—*viz.*, blocks, bolts in lieu of copper, and knees.
For chain rigging, wire rigging, and sheathing, it is extensively used, and the following CERTIFICATE, amongst many others, is annexed:—

Lloyd's Register, London, February 7, 1845.
2, White Lion-court, Cornhill.

The undersigned surveyors to this society did, at the request of Messrs. Malins and Rawlinsons, examine the Patent Galvanised Iron Sheathing upon the bottom of the brig *Mary Stewart*, lying in Messrs. Curling, Young, and Co.'s dry dock, Limehouse, and lately returned from a voyage to the island of Ichaboe, on the coast of Africa, and found it unbroken and perfect throughout the vessel's bottom, and no appearance of corrosion or oxide of iron upon its surface. The iron that had been exposed by puncturing the nail holes had become coated with zinc—the sheathing was nearly clean, and free from marine grass and animalculæ. It appears to have answered very well during the before-mentioned voyage, and the ship has sailed without it being found necessary to do any repairs to it.

PETER COURTENAY, } Lloyd's Surveyors.
I. H. RITCHIE, }
JAMES MARTIN, }

The company are prepared to supply all articles required, or execute work of every description.

Works—London, at Millwall, Poplar, near West India Docks; Staffordshire, Phœnix and Lea Brook Iron-Works—from which corrugated iron and every description of iron, galvanised or otherwise, can be supplied; also, from the South Wales Works, near Bridgend, Glamorganshire.

Office—3, Mansion-house-place, London. 11

CAUTION AND NOTICE.

This GREAT PATENT, like every good one, is invaded, and, by the law's delays (and its miserable state as regards the interests of patentees), the parties are able to evade the consequences some short time longer. The same thing has occurred with other patents. In Neilson's Hot-Blast Patent the invasion went on for years: but one firm only had at last to pay upwards of (£120,000) one hundred and twenty thousand pounds penalties. BUYERS as well as SELLERS are LIABLE, and the PATENTEES will PROCEED AGAINST all PARTIES who INVADE this—one of the most IMPORTANT INVENTIONS ever brought into use.

Actions are proceeding against Messrs. Morewood and Rogers, Messrs. Walker (Gospel Oak), and many others.

The company take this opportunity of giving the most unequivocal contradiction to the advertisement issued by Messrs. Morewood and Rogers on 8th August.

PATENT GALVANISED TINNED IRON. MOREWOOD and ROGERS' PATENT.

The PATENTEES beg to call the attention of the PUBLIC to the ABOVE METAL, which is being USED extensively by the LORDS COMMISSIONERS of the ADMIRALTY, the BOARD OF ORDNANCE, and OTHER PUBLIC BODIES,

FOR ROOFING AND OTHER PURPOSES. 12

The large WAREHOUSES and SHEDS in the LIVERPOOL DOCKS have had the ZINC with which they were formerly covered STRIPPED OFF, for the purpose of being COVERED WITH IT; and the NEW DOCK WAREHOUSES of that city are likewise being COVERED WITH THIS METAL.

It is peculiarly ADAPTED for RAILWAY STATIONS, as forming a light, strong, and incorrodible covering.

This PROCESS is the ONLY ONE by which the QUALITY of the IRON is PRESERVED, instead of being injured; and it is, therefore, so very malleable, that it may be worked up with the greatest ease into articles of all descriptions.

Further information may be obtained on application at the WAREHOUSE
No. 9, STEEL-YARD UPPER THAMES-STREET

THE PATENT GALVANISED IRON COMPANY. —CAUTION.—The public are cautioned against giving credit to the mis-statements put forth by the Galvanised Iron Company in their advertisement.

The ONLY ACTION proceeding in regard to this Patent is one, NOT AGAINST MOREWOOD AND ROGERS, OR ANY OTHER PARTY CONNECTED WITH THEM, BUT A WRIT OF *SCIRE FACIAS* AGAINST THE COMPANY'S PATENT FOR ITS CANCELLATION.

Nothing can be more unfortunate than the comparison between this Patent and that of Neilson's, which was held by the jury to be valid, whereas THAT OF THE GALVANISED IRON COMPANY WAS, AFTER THREE DAYS' TRIAL, FOUND, UPON THEIR OWN EVIDENCE, TO BE INVALID.

They assert that their Patent is being invaded—this we entirely deny; and to show the folly of the charge, the working of it was found by the jury to be impracticable. No one—not even they themselves—ever have, or ever will be able to work it.

In working as they now do, they have ADOPTED PART OF OUR PROCESS, specified in our patent, WITHOUT OUR LEAVE OR LICENCE.

With regard to delay, it has been entirely on their part, as the records of the courts will prove. They have availed themselves of every opportunity to hinder and delay the *scire facias*, now proceeding, by applications for time, &c.; and, finally, by putting in a plea, which their solicitor swore, he believed, to be necessary for the defence of their patent from cancellation, but which the Lord Chancellor, on Monday last, refused to admit, and dismissed their appeal with costs.

MOREWOOD AND ROGERS,
Patentees of Galvanised Tinned Iron. 13
August 29, 1845. Warehouse, 9, Steel-yard, Upper Thames-street.

PATENT GALVANISED IRON COMPANY.—NOTICE. —This patent was decided by the jury, in Patteson v. Holland, tried in the Common Pleas in February last, to be *invalid*, and their verdict has not been set aside. The delay in actually cancelling the patent by the *scire facias* issued for that purpose is solely ascribable to the patentees resorting to frivolous and dilatory measures for postponing the proceedings—thus showing that they well know how such proceedings must terminate. 14

BY HER MAJESTY'S ROYAL LETTERS PATENT.

SMART'S ELLIPTICAL CONVEX METALLIC PADDLE FLOATS, FOR PROPELLING STEAM-SHIPS.—The very great superiority of this invention over the common float, in *all points*, having been fully proved by its use on various steamers of from 90 to upwards of 200-horse power—and applications being made for licensing several iron steamers, from 70 to 300-horse power, the patentee confidently recommends it to the Government and the public generally.

Its superiority consists, in beauty of appearance, stability, durability, its property of greatly reducing vibration and undulation, inexpensiveness, powerful agency in checking a ship in chance of collision—and what is of the greatest consequence, giving an immense increase of speed. All these must have a powerful influence, not only on steam proprietors, but more especially on the minds of the steam-travelling public.

These Floats can be easily applied to any wheel. 15

Applications for license (for which a fee of 10s. per horse-power is charged) to be made to the patentee, Mr. Robert Smart, 5, Grenville-place, Hotwells, Bristol, or his agents.

PATENT IMPROVEMENTS IN CHRONOMETERS. WATCHES, AND CLOCKS.—E. J. DENT, 82, Strand, and 33, Cockspur-street watch and clock maker, BY APPOINTMENT, to the Queen and his Royal Highness Prince Albert, begs to acquaint the public, that the manufacture of his chronometers, watches, and clocks, is secured by three separate patents, respectively granted in 1836, 1840, 1843. Silver lever watches, jewelled in four holes, 6 gs. each; in gold cases, from £8 to £10 extra. Gold horizontal watches, with gold dials, from 8 gs. to 12 gs. each. 16

DENT'S PATENT DIPLIEDOSCOPE, or meridian instrument, is now ready for delivery. Pamphlets containing a description and directions for its use 1s. each, but to customers gratis.

SEYSSEL ASPHALTE COMPANY—CLARIDGE'S PATENT.—ESTABLISHED MARCH, 1838,
FOR WORKING THE MINERAL ASPHALTE ROCK OF PYRIMONT SEYSSEL,
A Bituminous Rock, situate on the Eastern side of the Jura.
ROUEN, MARSEILLES, AND STANGATE,
Surrey Side of Westminster-bridge, London.

The ASPHALTE OF SEYSSEL has been EXTENSIVELY USED, since March, 1838, for the following useful purposes:—

FOOT PAVEMENTS (public and other)	MALT-HOUSE FLOORS
KITCHEN FLOORS	PIGGERIES, &c.
BASEMENTS—where it is essential to keep damps from rising	COVERING OF RAILROAD and OTHER ARCHES
GARDEN WALKS and TERRACES	The only effectual mode to prevent the percolation of water, which also renders it very appropriate for the
CARRIAGE DRIVES	LINING OF TANKS, FISH PONDS,
COACH-HOUSES and STABLING	DRAINS, &c. &c.
DOG KENNELS	
BARN FLOORS	
TUP ROOM FLOORS	

17

Nota.—The Seyssel Asphalte Company are prepared to enter into special contracts for the execution of railway work, and other public works of magnitude.
T. FARRELL, Secretary, Seyssel Asphalte Company, Stangate, London.

RYE AND THOMAS, MINE AGENTS AND DEALERS IN STOCKS, RAILWAY AND OTHER SHARES,
80, OLD BROAD-STREET, LONDON, AND AT LISKEARD, CORNWALL. 18

JAMES LANE, SHARE AGENT, *HALL OF COMMERCE, LONDON.* 19

WILLIAM TRENERY, DEALER IN RAILWAY AND MINING SHARES.—ESTABLISHED TEN YEARS.
OFFICES, No. 30, THREADNEEDLE-STREET, LONDON. 20

WILLIAM FOX AND SON, No. 53, CASTLE-STREET, LIVERPOOL, have always on SALE PIG-IRON, RAILWAY BARS, CHAIRS, and IRON of every description.—TIN PLATES, WIRE, &c. 21

MESSRS. LAMOND, SMALE, and LAMOND'S PUBLIC SALE OF RAILWAY SHARES, &c., are HELD, at the Hall of Commerce, Threadneedle-street, every TUESDAY and FRIDAY, at One o'clock precisely.—Orders received until Four o'clock of the day prior to sale.—London, Feb. 20, 1846. 22

FIR TREES.—TO BE SOLD, A LARGE QUANTITY OF SCOTCH FIR TREES, FIT FOR MINING PURPOSES, varying from 2, 3, and 5 feet of timber in each tree, and from 10 to 15 feet long.—Price from 1s. 6d. to 3s. 3d. per tree, to be delivered in Sutton Pool, Plymouth Harbour, to any vessel.—For further particulars, application to be made to Mr. Crace, Plympton St. Mary, Devon. Also a large collection of STONES, &c.—The whole for cash payments. 23

EAST CARADON MINE.—TO BE SOLD, BY TENDER, ONE, TWO, or THREE SHARES in the ABOVE MINE, which, "from its being contiguous to, and embracing the lodes of, the famous South Caradon Mine"—"now yielding such large profits"—is considered to be a very promising concern. The adventurers, "25 in number only," are highly respectable, and the management of the mine is under the superintendence of Capt. J. Climo, from whom any information can be obtained.—Tenders, addressed Mr. John Parkin, jun., surveyor, Lostwithiel, Cornwall, will be received until the 7th day of March next—immediately after which, the party whose tender is accepted will have notice thereof. 24

CORNUBIAN MINING COMPANY.—Whereas, at a Special General Meeting of the shareholders of this company, held at the office of the company, No. 44, Finsbury-square, London, on the 16th day of February inst. (and which meeting was called for the purpose of confirming, or rescinding, certain resolutions for dissolving this company, passed at a previous Special General Meeting of the shareholders thereof, held on the 2d day of February inst.), it was resolved,—That such meeting, so held on the 16th day of February inst., be adjourned to Monday, the 2d day of March next, and that such adjourned meeting be held at the office of the said company, No. 44, Finsbury-square, London, at Two o'clock in the afternoon precisely.—Now, therefore, Notice is hereby given, that such ADJOURNED MEETING will be HELD on the 2d day of March next, at the place and hour above-mentioned, for the purpose of confirming, or rescinding, the said resolutions, so passed on the 2d day of February inst.

And further take Notice, that, if such meeting should confirm the said resolutions, passed on the said 2d day of February, then it will also be proposed, at the said adjourned meeting, to appoint a committee of shareholders to assist the directors in disposing of the property of this company, and settling the affairs thereof.

44, Finsbury-square, Feb. 17, 1846. 25

LONDON AND WESTMINSTER BANK.—Notice is hereby given, that the ANNUAL GENERAL MEETING of the proprietors of this company will be HELD at the Bank, in Lothbury, on Wednesday, the 4th day of March next, at One o'clock precisely, to declare a dividend, and for other purposes.—At this meeting Joseph Esdaile, Esq., John Stewart, Esq., M.P., and Sir John Kirkland, retire by rotation; but, being eligible for re-election, offer themselves accordingly. 26

By order of the board,
Lothbury, Jan. 21, 1846. JAMES WILLIAM GILBART, General Manager.
The transfer books will be closed, to prepare for the dividend, from Feb. 17 to March 10.

CALEDONIAN RAILWAY.—Notice is hereby given, that the stated ORDINARY GENERAL MEETING of the shareholders in the Caledonian Railway Company, is to be HELD in the Royal Hotel, Edinburgh, on Wednesday, the 25th proximo, at One o'clock precisely.—The register of transfers will be closed from the 17th till the 25th—both days inclusive. By order, 27

Office, 122, Princes-street, Edinburgh, Jan. 28, 1846. D. RANKINE, Sec.

LONDON AND BIRMINGHAM RAILWAY.—The public are requested to take Notice, that, on and after the 1st of March, the EXPRESS TRAIN, now leaving London at Four P.M., will be dispatched at FIVE P.M., and that the times of arrival at Birmingham, Liverpool, Manchester, and Chester, will be one hour later than at present. By order, 28

Euston Station, Feb. 18, 1846. R. CREED, Secretary.

GRAND JUNCTION RAILWAY.—The public are requested to take Notice, that, on and after the 1st of March, the EXPRESS TRAIN, now leaving London at Four P.M., and Birmingham at 10 m. past Seven P.M., will be dispatched from London at FIVE P.M., and that the times of arrival at Birmingham, Liverpool, Manchester, and Chester, will be one hour later than at present.

By order, MARK HUISH, Secretary.
General Manager's Office, Lime-street, Liverpool, Feb. 18, 1846. 29

COMPRESSED AIR-ENGINE COMPANY. *No. 5, PALL-MALL EAST, LONDON.*
(PARSEY, PATENTEE.)

Compressed air can by this invention be applied to all the various purposes for which steam is now employed, and when wind or water power can be used for the purpose of condensing the air, will effect a total saving of the expense of steam power. The object of this company is to build one or more full-sized engines and the necessary appendages, in order to test and establish the superiority of the invention. For this purpose, a deposit of 1*l.* 1*s.* is required upon each share, and it is not expected that a further call will in any case be required, as the arrangement made with the patentee provides that his remuneration shall be dependent upon, and proportioned to, the profits made by the company.—Prospectuses and every information can be obtained from, and applications for shares in the usual form, made to the secretary, at the company's office, 5, Pall-mall East, London; Messrs. Davies and Son, solicitors, 31, Warwick-street, Regent-street; and of the following sharebrokers—London, Messrs. Sutton, Gribble, and Sutton, Royal Exchange; Manchester, Messrs. Cardwell and Sons; Leeds, Messrs. Hebdon and Parkinson; Bristol, Messrs. Tate and Nash; Edinburgh, Messrs. Blackwood and Thomson; Aberdeen, Messrs. James, Black, and Co. 30

COMPRESSED AIR-ENGINE COMPANY. (PARSEY, PATENTEE.)

The WORKING MODEL is in OPERATION, and OPEN to INSPECTION, at the offices of the company, 5, Pall-Mall East, between the hours of Eleven and Four daily. 31

RAILWAY GREASE.—RAILROAD CONTRACTORS, MINING AGENTS, and OTHERS, who require a FINE CHEAP GREASE for HEAVY BEARINGS, are requested to TRY JOSEPH TURNBULL'S ANTI-FRICTION GREASE, which is proved by scientific men to surpass all others for its lubricating qualities, and for cheapness.—Samples and price, per return of post, by applying to F. Taylor, No. 45, Munster-square, Regent's-park, SOLE AGENT FOR LONDON; or H. Singleton, Bodmer, and Co., Marble-street, Manchester.

P.S.—Slings and double locks, to raise from two to twenty tons, at wholesale prices. 32

TO RAILWAY CONTRACTORS, COLLIERY OWNERS, ENGINEERS, AND OTHERS.—The PATENT VEGETABLE GREASE, at REDUCED PRICE, 12s. per cwt. for cash—the quality the same as that formerly sold at 30s. per cwt.—JAMES THOMAS FITT respectfully thanks those friends who have patronised him during the last ten years, and trusts, by strict attention to the quality of the article, and promptness in completing orders, to merit the continuance of their favours.—The PATENT VEGETABLE GREASE, for ANTI-FRICTION PURPOSES, at REDUCED PRICE.—Orders, stating by what conveyance, addressed to J. T. Fitt, Spring Mead, Bermondsey New-road, London. 33

TO ENGINEERS, RAILWAY CONTRACTORS, MINING AGENTS, IRONMASTERS, AND OTHERS REQUIRING FINE GREASE for MACHINERY and AXLES of every description.—JOSEPH PERCIVAL'S IMPROVED ANTI-FRICTION GREASE is—after trials on machinery and axles of every kind where constant friction is kept up—admitted to be the most useful, economical, and best preparation of the kind ever offered to the public.

References to scientific and practical men can be given, and testimonials shown of its great excellence.—Samples forwarded on application at the manufactory, Green-street, Wellington-street, Blackfriars-road, London. 34

OFFICE FOR PATENTS, 7, STAPLE INN, HOLBORN. J. MURDOCH (successor and late assistant to Mr. Hebert) informs INVENTORS and PATENTEES, that at his OFFICE they can obtain

REFERENCE TO A CLASSIFIED LIST OF PATENTS

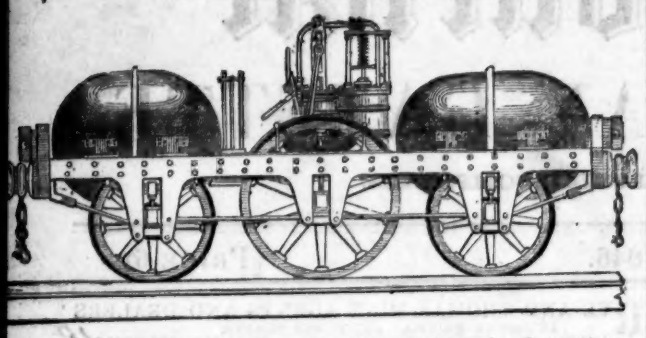
(THE ONLY ONE EXTANT), which shows at one view all the Patents ever granted for any particular object, whereby they may save much trouble and expense, and procure information not otherwise obtainable. BRITISH and FOREIGN PATENTS OBTAINED, and USEFUL and ORNAMENTAL DESIGNS REGISTERED.

SPECIFICATIONS carefully prepared, and REPORTS of ENROLLED SPECIFICATIONS furnished on moderate terms.

FINISHED and WORKING DRAWINGS executed with accuracy and dispatch. 35

PARSEY'S COMPRESSED AIR-ENGINE.

TO THE EDITOR OF THE MINING JOURNAL.



Sir,—Stephenson's engine, according to Tredgold, has drawn 40 tons, at 35 miles per hour. This engine evaporated 77 cubic feet of water per hour; that is, converted that quantity of water into steam. The utmost quantity of steam, in bulk, that can be generated from a cubic foot of water is 1711; that is, the space occupied by steam of 212° is 1711 times the bulk of water, when it is capable of resisting the mean pressure of the atmosphere, which is 2120 lbs. on the square foot.

Hence, 1711 × 2120 = 3,627,320 lbs. raised one foot.

3,627,320 lbs. per cubic foot of water
77 cubic feet per hour

25391240
25391240

279,303,640 lbs. raised 1 foot per hour per steam at 212°.

Therefore, 279,303,640 lbs. is the quantity of power requisite to draw a train of 40 tons, at the speed of 35 miles per hour.

If the reservoir, or receiver, of *power*, in a compressed air-engine, have a capacity for 100 cubic feet, and be charged with 60 atmospheres, or 60 times 100 cubic feet, there will be a pressure of 900 lbs. on every square inch of the receiver, or 129,600 lbs. per square foot of the surface. The power contained will, therefore, be—

144 × 100 × 60 × 450 = 387,800,000 lbs. raised 1 foot;

which will be more than equal to the power of 77 cubic feet of water converted into steam at 212°; and, consequently, will be sufficient to draw a train of 40 tons, at the speed of 35 miles per hour.

It is necessary the general reader should know that it is not by steam that a locomotive is driven, but by the *power* of steam, and that I do not propose to work by air, but by the *power* of compressed air. Power may be gained by either means; but the great matter of importance is, which is the simplest, cheapest, safest, and most efficient? The first point is, can vessels be constructed sufficiently strong to hold the power safely?—Wrought-iron vessels, not subject to any heat, are readily made; and the fact is fully substantiated by the portable gas receivers which were in use many years ago—they were proved to stand 630 lbs. per square inch—were only one-ninth of an inch in thickness, and could not be burst with a lesser pressure than 3000 or 4000 lbs. per square inch on the surface. I recently proved an old one up to 1140 lbs., or equal to 73 atmospheres, so that there can be no question in point of strength of materials. Next comes the obtaining the power, or the means of readily and economically compressing air. Without claiming any further advantages at the present moment, it is sufficient to show that, by employing the same amount of power—gained by means of steam, wind, or water—as may be expended in working a condensed air locomotive, what a considerable gain occurs, for then a locomotive may be worked at the much cheaper rate of a stationary engine. In the latter, cheap coal takes the place of dear coke in the former; besides, there is no waste in the use of the condensed air, while there is a constant loss of steam in blowing off in stoppages, &c.

A steam locomotive, from carrying with it its engines and furnace, is constantly consuming itself, and little of it remains at the end of three or four years—while the parts of the air-engines, which take the place of the boilers, furnaces, &c.—namely, the reservoirs—are nearly indestructable; therefore, the gain in *durability* is indisputably great: wells, pumps, and many incidental expenses of stations, will be saved. To work a line by means of compressed air, stationary engines will be required at the terminus, and stations at 50 miles distance. When an engine is required to be started, a communicating pipe, attached to a reservoir of compressed air at the terminus, is quickly connected to the charging valve at the back of the engine; on opening the stop-cock, the highly compressed air will rush from the stationary receiver, and fill the receivers of the locomotive to the calculated amount of the load and distance. The attachment, filling, and detachment pipe, need not occupy three minutes.

The engine being charged with the whole amount of power hitherto expended in generating steam power over the same journey, the regulator being set at the usual working pressure, an expenditure equal to that now used can take place, for the pistons are not acted upon direct from the reservoirs or great stock of power, but from a cylinder in which the regulator always preserves a uniform working pressure, till such time as the gradually declining pressure of the reservoirs be reduced to the working pressure, by which time the train will have reached the station at 50 miles distance, when the replenishment will take place as speedily at the charging at starting from the terminus, and in much less time than is taken for a supply of water. There can be no chance of public accident, as the reservoirs, or receivers, will be constructed, and proved to stand safely double the amount of pressure ever charged in them, and as the pressure gradually lessens in them (although the working pressure is always maintained in the cylinder that feeds the driving cylinders), no danger from bursting can be apprehended. In the event of a mail train following a luggage train, and likely to run into it, the driver of the luggage train can stiffen the spring of the regulator, increase instantly his pressure on the piston, and keep ahead of the mail train till they can reduce their speed, and avoid accident, which, in a similar case, cannot be done in the steam system. Many advantages and superiorities of action may be adduced, which need not be brought forward, as they will naturally suggest themselves to all persons conversant with engineering science.

The following is a calculation of the comparative cost of working the Birmingham line:—It is in evidence that 17 trains (1843) run each way daily; 24 trains will then be amply sufficient. It is in evidence that the *maximum* power of a locomotive engine is 3000 lbs. tractive force; *every* air engine being of that power will be amply sufficient

The line is actually 112¼ miles long; if it be estimated at 120 miles, all variations will be covered. Then,

24 × 2 × 3000 × 120 × 5280 = 91,238,000,000 lbs. lifted 1 foot high.

The power of steam is reckoned by an unity of 33,000 lbs. lifted 1 foot high in a minute, and called a "horse-power."

$$\frac{91,238,000,000}{33,000 \times 60 \times 24} \qquad \frac{91,238,000,000}{95,040,000} = 1920 \text{ horse-power.}$$

But, as some air will escape without doing work, and as it is the opinion of some that there will be double the amount of friction generated in this system, it will be advisable to add 50 per cent. to the working-power of the engines. Say, 2880 horse-power engines always at work, this power may be stationed thus: two 360-horse engines at London; four 360-horse engines at Wolverton; three 360-horse engines at Birmingham; with one engine extra at each station.—Total, 11.

360 horse engines, at 25*l.* per horse-power	£90,000
Engine-houses and wells	12,000
Magazines for holding air	8,000
50 locomotive air-engines, at 700*l.*	35,000
Total capital sunk, according to Mr. Parsey's system	£149,000
Present capital, authentic	£321,974

The annual charge of working by condensed air—

2880 horse-power engines consume 33,800 tons coal, at 9*s.*	£15,210
Oil, hemp, and tallow, at 5 per cent. on cost	4,950
Ditto on locomotive air-engines	1,750
Superintendence, as now	4,634
Wages of stationary engineers and stokers	4,742
Ditto of engine drivers	5,000
Total	£36,286

Steam system, 1843, authentic—

Wages of engine drivers and firemen	£ 9,673
Coke	25,541
Oil, hose pipes, and fire tools, pumping-engines and water	4,099
Labourers and cleaners, waste and oil	4,194
Repairs of engines and tenders	12,521
Coals and firewood, expenses of stationary engines at Wolverton, &c.	3,172
Superintendent, clerks, and foremen's salaries, &c.	4,634
Total	£63,834

The above power will convey 90 tons net by each train.

Then, 90 × 24 × 2 × 112½ × 365 = 176,994,720 tons carried one mile, or 1-120th of a 1d. per ton per mile.

The above calculation of the working expenses of air locomotives is made upon the assumption of such steam power being required to provide air power, which is making the worst that is possible of the case. I have no hesitation, however, in saying that the amount of stationary steam power is taken at one-third, or even one-half, more than *practice* will *prove* to be necessary. A steam locomotive carries, I may say, its own stationary engine with it; it has, therefore, not only to produce the power of propelling the machine and the loaded train, but that also which works itself; and, I believe, the best authorities calculate that only six-tenths of the power generated can be relied on as effective power. We must not forget the sacrifice of power and consequent loss that takes place in getting up the steam, blowing off before an engine starts, in checking the speed, in stoppages at stations and at the terminus. It must be evident that, by securing all the power to be produced by cheap stationary engines, and working a locomotive by that power, without the above-mentioned waste and sacrifice of power, no comparison can be made between the steam and compressed air systems.

Estimate of the size and thickness of a locomotive air-engine magazine, to travel 60 miles, with a traction of 3000 lbs.:—

5280
60

316800
3000

950400000 lbs. lifted 1 foot high.

There will be a loss in working of—say, 20 per cent.

4)950400000
237600000

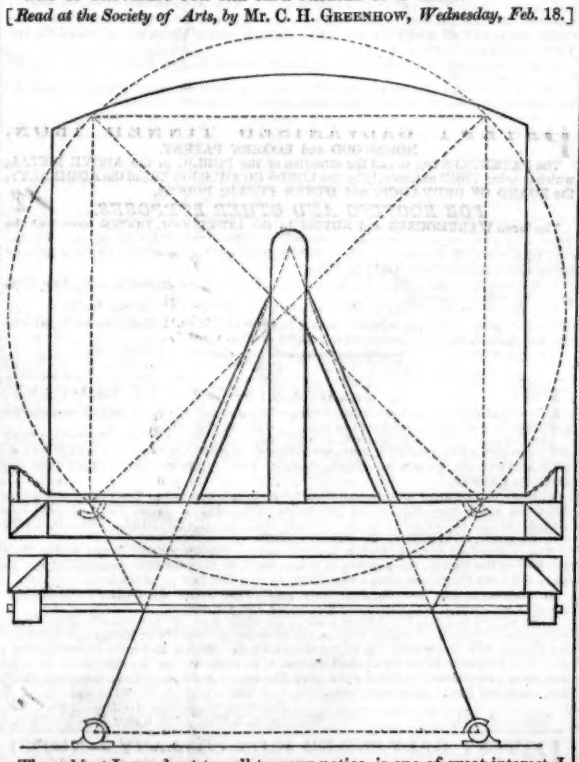
1188000000 lbs. of elasticity to be compressed.

Let it be proposed, to compress the air to 1000 lbs. pressure, which will give a medium working pressure of 500 lbs. per square inch; 1000 lbs. pressure per square inch is equal to 66 atmospheres—consequently, a column of air compressed into 66 times its density—*one* ft. high, and 1 in. square at the base—will lift 500 lbs. 66 ft. high, or 33,000 lbs. 1 ft. high; consequently, a column of compressed air of 66 atmospheres, being 1 ft. high, and 1 ft. square at the base, will lift 33,000 × 144 lbs. 1 ft. high, or 4,752,000 lbs. 1 ft. high. Then, as 4,752,000 lbs. will require one cubic foot, what will 1,118,000,000 lbs. require?—Answer, 237 cubic feet. In like manner, if the air were compressed to 2000 lbs., the contents of the magazine required would be 60 ft. A magazine of 3 ft. diameter, 9 ft. long, and 1 in. thick, would, therefore, be amply sufficient; the weight of such a magazine would be 4000 lbs.—AN ENGINEER: *London, Feb.* 18.

ON RAILWAY LOCOMOTION,

AS REGARDS THE EFFECT OF THE CENTRIFUGAL AND CENTRIPETAL FORCES ON BODIES IN VERY RAPID MOTION, SUGGESTING THE MOST EFFICIENT WAY OF PROVIDING FOR THE SAFE PASSAGE OF A TRAIN.

[*Read at the Society of Arts, by* Mr. C. H. GREENHOW, *Wednesday, Feb.* 18.]



The subject I am about to call to your notice, is one of great interest, I might add of most vital importance, at this time, when the mode of transit by railway is becoming so general, and must, to judge from present appearances, very soon supersede all others; and although the speed has become such as to render journeys, which formerly were tedious, and took much time to accomplish, now of no moment—yet the cry is still on! on! and all the energies of the engineers have been directed to perform the greatest possible distance in the smallest space of time. The first thing I shall ask you to consider is, how during this rapid passage of a train, the centrifugal and centripetal forces act and re-act upon each other?—also, how the evil tendencies of those forces may be best kept in check, and their true equilibrium preserved during this great acceleration of speed? In order that I may not take up more of your time than necessary, I will make my remarks as brief and comprehensive as possible, stripping them of all philosophical abstractions. You are all aware, that on a body being put in motion, it becomes subject to laws and influences attendant on, and connected with, that motion, which are created by it, and cease to operate immediately on the body again becoming quiescent. Now, the influences and tendencies of the centrifugal force, are the most likely to create danger; those are to make bodies in motion proceed in a directly straight line, and it is at very great risk that when the speed is rapid, they can be diverted from their direct course—and as the speed increases, the more difficulty and danger there is in causing a diversion. On a train of railway carriages being put in motion, the rails become the regulators, or directors, of the course to be taken by the progressive, or centrifugal force, and when a curve is made to either side, the flanges of the wheels coming in contact with the rail on the side opposite the direction taken by the curve, cause the diversion, but it may readily be conceived how easily the slight resistance offered by the flange of the wheel, to the direct progress of the train, may be overcome by the impetus of so great a weight, and should it not prove sufficient, I need not say how tremendous would be the consequences. There are many other incidental occurrences which have a tendency to divert this force, and thus endanger the safety of a train—a sleeper sinking, or the rail sitting loosely in its chair, will have that effect; also, when in very rapid motion, the unequal resistance of the atmosphere, caused by the wind blowing across the line of motion, or by emerging suddenly out of a tunnel, passing on to, or off from, an elevated embankment, will all have a tendency to destroy the equilibrium of those forces, by giving a vibratory motion to the carriages, will cause the wheels to come in violent contact, with first one rail, then rebound to the other; this rebound gaining strength with every blow, until the oscillation is sufficient to throw the carriage over. The present system pursued in railways is to add weight to the carriages, in order, by their gravity, to resist the tendencies of the centrifugal force; this may *answer imperfectly* in some cases, such as a diversion caused by atmospheric resistance, giving an inclination to one side of the carriage to elevate, or a slight inequality in the rails may be overcome by the increased weight. But, let a sleeper have sunk, or a curve take place in the line, and for every pound of weight added, the centrifugal force is more difficult to keep in check, or to divert in the desired direction, because the greater the weight the stronger is the progressive, or centrifugal, force at the like speed. An attempt is also made to assist the gravitation in overcoming the centrifugal force in *curves*, by raising the *outer* rail above the level of the *inner* one, in such a manner as to throw the weight within the perpendicular, and so resist the impulsive inclination to fly off at a tangent. Now, this may do very well when the *speed* is *moderate*, and the upper rail, which has to offer the whole resistance to a directly straight progress, remains perfect; but let the speed be great, or the chairs of the upper rail become loose, or inadequate from any cause, to offer a sufficient resistance to the flange of the wheel grinding against it, the whole train must then be thrown over with a fearful result.

What I wish to propose is, to devise some means by which the body in motion may contain within itself a counteracting power, which, being acted on by the same influences, and receiving its impulse from the same cause as the centrifugal force, and yet acting in a different manner, may, at all times, and with certain result, step in and restore the right balance of the forces, so as completely to resist and counteract their evil tendencies. This power may at once be created, by suspending the carriage like a pendulum, but, at the same time, restraining it from vibrating, in order that the following result may occur:—When an impulse is given to the centrifugal force, diverting it in either direction, the same impetus will cause the pendulum to vibrate in the like direction; but being restrained from doing so, its whole power will be directed to counteract the effect which the diverted centrifugal force would have to raise up the side of the carriage *from* which the impetus is given, the whole weight of the carriage being thrown between the pivots on which it is suspended, and the point on the elevating side at which it is restrained and prevented obeying the inclination to vibrate—thus perfectly providing for the safe passage of the train. In going round a curve, a precisely similar action of the pendulum, in reference to the centrifugal force, takes place; the power of the one always increasing or diminishing in the same degree as the other, in a ratio equal to the speed at which the train is moving; the pendulum always maintaining a sufficient ascendency to secure the train remaining on the rails. You must all have remarked something very similar to this take place, when, at an exhibition of horsemanship, as the horse goes rapidly round the ring or amphitheatre, both it and its rider lean over with a considerable inclination towards the centre, which increases with the speed at which they are going. Now, this is an instinct implanted by Nature in the animal, and which he would find it difficult, if not impossible, to resist, by throwing its weight inwards to the centre, to counteract the tendency of the centrifugal force to make it move in a straight line; the inward inclination increasing precisely in a similar ratio or degree to the power given to the centrifugal force by the speed, so as always to maintain the balance, and assure it proceeding safely in the right direction. I shall now proceed with an inquiry, which I have no doubt you will agree with me in thinking is most essential to the safety of bodies intended for very rapid motion—that is, how their dimensions and weight ought to be arranged relatively towards each other, in order that they may at all times, and in every contingency, preserve the true equilibrium between the centrifugal and centripetal forces; because, unless such an arrangement is made, and a mathematical precision introduced into the construction of railways, and the carriages which are to move upon them, never for one moment can we be assured of a freedom from accident—being liable at any time to be thrown off the line by the causes which are so constantly occurring to disarrange those forces.

The question, therefore, which naturally suggests itself, is, how would Nature dispose of the parts of an inanimate body intended to move with great rapidity, and by what means would she provide for maintaining the right balance of the forces brought into operation by that motion? I think I may safely answer this question, by stating that the form of a globe would be given to the matter intended to move, in order that all the parts being arranged round one centre, they might equally press forward in the same direction; next to preserve the true balancing of the integral parts, it would give to the mass a rotatory motion on its own axis—thus the centrifugal force of the projection, together with that created by the revolution on its own axis, would jointly keep in check, and maintain the balance with, the centripetal. I shall not now state how this balance is effected, or would be preserved by the relative increase or diminution of either force, but at once proceed to apply the subject to the point in question—namely, railway locomotion. When the carriage is placed on the rails, they become the basis on which the whole machine is to act, and, consequently, from them the calculations must be made for the right adjustment of every part; and in proportion to the dimensions of the base, so must be the entire body or superstructure. In order to preserve the proper relation between the superstructure and the base, I take the distance between the rails, measured from the centre of each rail, and make it one side of a square; and where lines drawn from the opposite angles of this square meet, will be the centre of a circle (taking the distance between the opposite angles for the diameter), containing the square within it. This circle must be the circumference, within which the matter intended for locomotion is to be arranged, allowing the lower side of the square to rest on the top of the wheels, in order that above that the arrangements may be such that the carriage is equally proportioned within the circumference; this will at once secure a due and relative adaptation between all the parts (*see figure*). Now, the body moving on a railway is subject to other influences than those attendant only on its own motion, and the effects of which it will be necessary to provide against: there is, in the first place, friction—to avoid which it will be necessary to place it on wheels, so as greatly to diminish the resistance offered by it; next, there is the resistance of the atmosphere; and, "last though not least," there is gravitation, which, on the balance of the forces attendant on its own motion being disturbed, will have a tendency to assist the centrifugal force in throwing the carriage over; and as it would not exactly do to give the shape of a globe to the moving body, we must arrange it in such a manner as to gain as many of the advantages of that shape as our limited means will allow.

After having arranged the proportions, in proper relation to each other, taking the distance between the rails as the basis, we must next follow Nature in her operations, and give the machine power within itself to adjust and maintain the true equilibrium of the centrifugal and centripetal forces; in order to do this, the carriage must be distinct, or separated, from the wheels on which it is borne, not resting firmly and immoveably upon them, but suspended so as to have motion and influences of its own, independent of any action of theirs—in order that, on the occurrence of any contingency to disarrange, or divert, the centrifugal force, it may, as I have before described, at once counteract the effect. The simplest, and, therefore, the best, way to accomplish this, is to have the wheels secured to a sufficiently strong frame of wood, of proper dimensions, in proportion to the carriage they are intended to sustain, on which another frame of same size must rest, with springs between (*see fig.*) The upper frame, being the one to which the carriage is to be secured, must have an iron standard at each end, on which the carriage is to be suspended on pivots, inserted into the standard at the point where two lines meet, drawn from the centre of each rail at an angle of 22½ degrees within the perpendicular (*see fig.*); this point being considerably above the centre of the circle, the carriage will hang on the pivots, like a pendulum, having a tendency to vibrate, in whichever direction an impulse may be given; but, at the same time, it must be restrained from doing so by chains secured to the lower edge of each side of the carriage, and to strong holdfasts of iron on the outer side of the frame—by which arrangement the following results will be gained (*see fig.*) Should any contingency, or accidental cause, occur, to divert the centrifugal force, the same impulse which has that tendency, will also cause the pendulum to vibrate in the like direction; but it will be prevented from doing so by the chains I have above described, and thus the whole weight of the carriage, and the power of the vibration, will be placed in opposition to the centrifugal force. To assist in this operation, the spokes of the wheels must have an inclination from their circumference, or from where they rest on the rails, towards each other, at an angle of 22½ degrees, being in a direct line to the pivot on which the carriage is suspended—thus creating a fulcrum on which the restrained pendulum acts, offering a firm and direct resistance to any disposition towards a lateral motion from the diversion of the centrifugal force, also by the rail being round, and the tyre accurately fitted to it, allowing the play necessary in the above operation, without at all altering the adaptation or relation between the wheel and the rail, and without which perfect adjustment it would be impossible to secure the result I have described. Another advantage to be derived from the round rail, and conical shape given to the wheel, is, that should one side become depressed below the level of the other, from the sinking of a sleeper, or other unavoidable cause, the centre of gravity will

be kept within the perpendicular of the rail on which the wheel rests, until the depression, or elevation, becomes more than 22½ deg., the angle at which the spokes converge, and, of necessity, within that limit it must retain its position on the rail, passing safely along. During this operation, the lower rail becomes the fulcrum on which the carriage turns, and the concave tyre being adapted exactly to the convex surface of the rail, readily adjusts itself to the altered circumstances, still undeviatingly placing the pressure perpendicular to the rail's centre, and completely preventing the friction, which, under the same circumstances, takes place on the rails as at present constructed, on account of the flange of the wheel falling perpendicularly on the sharp edge of the rail, and thus causing a grinding and cutting, which, at any moment, may throw the wheel on to the rail, and so cause the train to run off the line.

The length of the carriage should not exceed twice the distance between the rails, or once and a half of the diameter of the circle; because, should it exceed that length, it will give an undue preponderance to the centrifugal over the centripetal force, and give to the carriage a tendency to oscillate, and be thrown over, should anything occur to divert the former of those forces. The advantages of the arrangements I have pointed out, will, I trust, be at once apparent, as the compactness given to the carriages; also the centre of gravity being brought below the pivots, and the balance of the forces so adjusted, must always act and re-act upon each other, in such a manner, as at all times to maintain their perfect equilibrium, and secure the safe passage of the carriages on the rails; at the same time that the perfect adaptation between the wheel and the rail secures a true and correct action of the whole machine; the concave tire being in every position exactly fitted to the convex surface of the rail, prevents all friction, excepting on the top of the rail for a few degrees on each side of a line perpendicular to its centre of bearing, certainly not more than 22½ deg. I shall now conclude, as I think I have said sufficient to make the diagrams and models perfectly understood.

CHEMISTRY OF THE STEAM-ENGINE.—Lecture II.

BY T. CRADDOCK, ESQ., BIRMINGHAM.

On taking 100 lbs. of coal, as stated in my former lecture, we found it required 966 lbs. of air to produce the combustion of the hydrogen and carbon therein contained; we also found that the product therefrom resulting was 47 lbs. of steam, and 332 lbs. of carbonic acid gas, together with 690 lbs. of nitrogen. As the carburetted hydrogen is produced at the top of the carbon, lying on the grate,—and as we have seen that the air is not only liable to be robbed of its oxygen, but that the carbonic acid is often converted into carbonic oxide;—from these conditions it follows, that the most obvious way to produce perfect combustion, or to prevent smoke, is to supply the air at the bottom of the grate, that is required to produce the combustion of the carbon, or glowing coke, remaining after the gases are dissipated; whilst the air required for the combustion of the carburetted coal gas should be supplied in such a manner as to come into due admixture therewith, before it is cooled down below the temperature of ignition. But the mere supplying air in sufficient quantity at the proper place, and even with a sufficiently elevated temperature, are not all the conditions the prevention of smoke requires—as the atoms of oxygen must be brought into close proximity with those of the gas to be ignited. This being the case, we perceive that, to bring such a vast quantity of atoms of the two gases into such close proximity, in the short time the gases are passing through the furnace, or before they are too much lowered in temperature to be inflamed, is a matter of some difficulty, and great importance to the prevention of smoke, and the greatest production of heat. This is called by chemists the diffusion of the gases, or the due saturation of the atoms of the one gas with the atoms of the other. Here I am bound to say, that Mr. Williams's plan does meet the conditions which chemistry requires for perfect combustion, better than any one of which I am at all aware of. Mr. Williams proceeds upon the principle of mixing the gas in the furnace with numerous small jets of air: this he effects by various modes, but generally somewhere about the bridge of furnace. These innumerable small jets, by reason of their more readily and completely mixing with the atoms of the combining gases, must be admitted to be well calculated to produce that intimate mingling that chemistry shows on this matter to be absolutely necessary. These are the conditions we see the abstract principles of this subject demand; but in practice other considerations and contingencies require to be taken into account, before we hastily conclude that these provisions will result in an unmixed good. For, as we have seen that, by such a large quantity of nitrogen passing with the air, from which the oxygen is obtained, carries with it a considerable quantity of heat: this cause, together with the danger of introducing too great a quantity of atmospheric air, if carried too far, must result in a waste of fuel, and producing also oxidation of the metal of the boiler. Therefore, the practical question here is to give to the coals in the furnace the due quantity of atmospheric air. This I fear is a somewhat difficult question in practise, as the required quantity is continually varying. In saying this I do not mean, but practice may accomodate itself to this difficulty; all I say is, that I think here is the greatest difficulty. Referring again to our remarks on the 100 lbs. of coal, we readily obtain the quantity of air requisite for the combustion of the gases, as also that required for the solid carbon. We find here, that to notice only the carburetted hydrogen, that the 5½ lbs of hydrogen (as before stated), require 42 lbs. of oxygen —the carbon, which had, together with this hydrogen, constituted the carburetted hydrogen, is a little over 16 lbs., which require another 41 lbs. of oxygen: so that we see this gas requires 83 lbs. of oxygen,—to obtain which will require about 288 lbs. of atmospheric air to be introduced into the gases—the remaining 678 lbs. of atmospheric air being that required for the yet remaining 73 lbs. of carbon, or as that introduced through the furnace bars. I merely give this as an approximation to the quantity of air most desirable to admit at either place. On the economy of slow or quick combustion, in as far as the quantity of heat evolved from any given weight of fuel is concerned, it is I think favoured by rapid combustion; so also is there a less wasteful dissipation of the heat evolved: therefore, in as far as the generation of heat is concerned, rapid combustion would seem to be preferable—so also with this view, would a thin fire seem to lead to the better combustion of the fuel. The next question for our consideration, is the absorption of the heat by the water of the boiler: here very high rates of combustion have two injurious consequences—the one upon the metal of the boiler, in the vicinity of the furnace; the other disadvantage, is the liability of a greater or less quantity of heat escaping in its not being absorbed by the water. We know that boiler plates of ⅜ or ½ inch thick are often heated very considerably on their exterior, above the temperature of the water in the boiler. This is known to take place to such an extent practically, as rapidly to deteriorate such parts of the boiler. It is clear, also, that the gases must escape at a temperature somewhat higher than the surface of the metal of the boiler over which they pass. These evil effects are no doubt very much increased by deposit,—whenever the boiler is so constructed as to admit of their rapid accumulation on the interior of the plates, on which the fire acts with intensity. The question here presenting itself is one for which we are not furnished with any good data, wherefrom to draw an unexceptionable conclusion, as to what the absolute difference of temperature of the external surface of boiler plates, or tubes, of different thickness, may be with an intense fire acting upon them, and having water within; that the difference is considerable, observation and experience clearly indicate. We are warranted in this conclusion, by the difference of colour, and often by the soot remaining unconsumed on the surface of the thin metal, whilst the thick metal frequently retains the heat to a considerable degree. It follows from this that not only is the thin metal much less injured by the action of the fire, and the heat conveyed with greater rapidity to the water, but the gases may be exhausted of a greater amount of the heat they contain, as the thinner surface they are in contact with is of a lower exterior temperature than the thicker metal under similar circumstances would be; for it must be borne in mind here, that it is the exterior temperature of the metal, along or over which the gases glide; and according to the difference of temperature of which, will depend the rapidity they impart their heat thereto. This being the case, we see that the temperature of the water within the boiler is a secondary consideration. This may be, and often is, comparatively low to that of the exterior, which limits the degree of absorption.

We have seen some of the advantages of thin metal—that it transmits heat more rapidly to the water within. and that the external surface thereby retains a lower temperature: hence there is a greater disparity between its temperature, and that of the hot gases. The difference of temperature between the external surface and the gases being the limiting cause of the degree of abstraction of the heat therefrom, which determines their temperature in passing off to the chimney, we can thus avail ourselves of a greater amount of heat, than would be possible with thick metal—all other circumstances being the same; so also is there much of the deterioration of the metal prevented by this more rapid transmission. The larger also is the quantity of surface on which the heat produced in the furnace acts; the smaller quantity is, as a consequence, to be transmitted through any given unit of surface in a given time. Time being one of the elements of first importance in bringing about an uniformity of temperature in adjacent bodies, it follows that the greater the time the hot matter is in contact with the surface of the boiler, the nearer will it approach the temperature of the water within, or in other words the less heat will pass away unabsorbed by the water. It may be remarked, that the element time may be obtained in two ways, either by the gases passing away sluggishly, as in the case of a slow draught, or by increasing the extent of surface over which they have to pass, ere they arrive at the chimney. As far as particular circumstances will permit, there can be no doubt but to avail ourselves of thin metal and large extent of surface, or slow draught, for extracting the heat, is best both for the durability and safety of the boiler, together with the economy of coal. This is what I think the soundest abstract principles demand, for their most beneficial application, in as far as economy of fuel, with the greatest degree of safety and durability in the boiler is concerned. If we turn now to the practical side of the question we shall find that, with our present means and knowledge, it too, in as far as all commercial considerations, all regard for human life, all fair prospect of extending the advantageous application of steam power, both as to cost in fuel, and portability of the engine—I say we find practically that all these recommendations are obtainable by the embodyment of these principles in tubular boilers, which combine all the requisites we ehave seen so desirable; as they would preclude danger from explosions, give us high-pressure steam, a great quantity of surface, little weight, with much compactness. Another practical view of this question is, that in locomotive boilers and some others, a difficulty arises in the production of heat, or in producing the combustion of a sufficient quantity of coke or coals, in a given time, by what I would beg to term the natural draught: hence recourse is had in our present locomotive engines to the jet, and in other instances to the fan. Now, this object may be obtained in another way—viz., by increasing the area of the grate surface, so as to produce as great an amount of combustion, without the jet, as is now produced with it. If this large extent of grate surface were subdivided by ranges of tubes, we obtain the quantity of surface requisite for the absorption of the heat; so also do we by this subdivision do much towards bringing the mass of gases into immediate contact with the surface, and thereby absorb its heat; for, as before intimated, the principles conducive to the best abstraction of all the heat given out by the coal, were those of time, surface, and subdivision. Now, it is clear, in reference to the effect time produces in this matter, that, if the gases pass in the slower stages of combustion at the rate of 20 feet per second, and in the higher rate of combustion at 100 feet per second, they will dwell quite as long in or on a five feet tube, as in the other case they would in or on a 25 ft. tube or flue; so that as long as we consume a given weight of coal, in a given time, providing also the same amount of surface wherewith to absorb the heat, together with a due mingling of the surface with the volume of gases produced,—and thereby prevent as much as possible the gases passing away without having their particles brought into immediate contact with the surface of the tubes (as it is a matter of first importance not to allow the gases to pass away in large or unbroken volumes), these provisions being made, it does appear to me, that there would be no great difference in the steam generating efficiency of a large grate surface, and slow draught, or small grate surface, and very quick draught, as in our present locomotive. If the economy of coal or coke would not be on the side of the large grate surface, which perhaps is a question only to be determined by accurate experiment, yet on which ever side the question of economy may preponderate, there would certainly not be much difference. I have dwelt thus particularly on this point,—because, on conversing with railway engineers, one of their strongest objections to my plan has been the annihilating of their present jet, and thence (as they say) destroying the means whereby they produce the steam. I shall have to speak more in detail on this matter in my last lecture. I merely observe, in passing, that I have better means in reserve than even this for meeting their objection, of destroying the present efficient mode of urging the fire, whereby the present locomotive far surpasses all other steam boilers in the rapidity with which it generates steam. The remedy alluded to is, that I would reduce the quantity of steam requisite to propel a given train, by two-thirds: this I should do in three ways—by obtaining from higher pressure steam a greater degree of expansion—by removing the resistance of the jet from the exhaust side of the piston, and at the same time removing the atmospheric pressure with the production of a vacuum equal to 24 inches of mercury.

In speaking of the advantages of the common boiler of the present day, it may be said—1st, That it is common, and therefore become familiar, to us by long usage; 2d, As boilers have hitherto been used with water, holding in solution substances, which, by the action of heat, occasion deposit. Our present boilers certainly do admit of practically generating steam from such waters, without any great inconvenience; and as they can be entered for the purpose of cleansing out, they also admit of the ready removal of the so deposited matter. Another advantage of the common boiler is, that, by its containing a great quantity of water, which, when the steam is at its highest fixed pressure, absorbs and retains a great quantity of heat, over and above that which goes to the conversion of steam, which, on the pressure lowering from a slackened fire or otherwise, a part of this heat passes from the sensible state in which it was held in the water, to that of the latent state in the production of steam—so that its tendency in producing uniformity in the boiler, hath well been likened to that of the fly wheel of the engines—the former storing up heat when in excess, as the latter does the excess of motion in the engine. The common boiler must be admitted, after the experience we have had in its construction, to be simple and familiar to us. Having said thus much of the advantages, I fear I have done much to exhaust its peculiar recommendations; as, if we come to test it by the soundest principles, in reference to its capabilities of sustaining pressure, or in reference to its destructive character, should it give way under its pressure, or to it qualifications for absorbing most effectively the heat produced from coal, or in its lightness for locomotive purposes, or in its compactness for marine engines, or yet in its durability,—in all these I fear it will not stand the strictest scrutiny by the strictest principles.

We will, before making a contrast between the tubular and the one we have just been speaking of, briefly point out the objections to the tubular; for, if I am not much mistaken, a detailed exposition of the defects of the former will at the same time display the good qualities of the latter.

ON THE NATURAL HISTORY OF COAL.—No. II.

BY WILLIAM ONION, ESQ., BIRMINGHAM.

Mr Onion commenced his second lecture by stating, that the object was to describe the carboniferous rocks of our own and other countries, to which, in a great measure, the supremacy of England as a nation is due. The physical features of the coal district had been well described by a French writer in the *Annales des Mines*, who represented three travellers as approaching Newcastle-upon-Tyne in different directions: one by railway from Carlisle would pass through an agricultural district; another by steam-boat from London would be struck by the vastness of the commerce, and especially of the coal-trade, of Britain; while a third, travelling by rail from Birmingham, over the series of coal formations, would have a vivid perception of the mineral wealth of the country: he would notice that everything is sacrificed to the coal in those districts; that innumerable tramroads, covered with laden waggons, extend in every direction; and that large towns occur at short distances along the line devoted to the residence of pitmen. Nothing but a visit to the mining districts could give a correct idea of the scene of energy and enterprise which they present. The lecturer then exhibited a beautiful model, (one square inch to a square mile,) representing a mass of carboniferous or mountain limestone, which formation is no doubt of marine origin, being composed of shells, corals, &c.; and observed, that if the coal strata had never been disturbed, they would have presented a regular appearance as in the model, but they would have been useless from the great depth at which they are found. By a second model he explained the operation of what is called denudation—that is, the removal of the higher strata, one of the most powerful of the agencies by which coal has been brought within man's reach. Dislocation and disturbance, was illustrated by another model, representing the district of Cross Fell, in Cumberland, which has been raised by this cause to a height of 2901 feet above the sea level. Vast as these effects may seem, they are nothing in comparison with what is continually going on—as, for instance, Sweden is in course of gradual elevation. The space of a square mile, represented in the model by a square inch, would contain all the people of the empire; and Mr. Sopwith had drawn an ingenious comparison between the possible speculations of animalcules, 15 or 20 millions of which could stand in a square inch, and those of mankind. After some remarks on the difficulty of estimating the extent of "faults," and consequently the amount of coal in a district, the surface being often quite even, through the operation of denudation, although (as at the Ninety Fathom Dyke, near Newcastle-upon-Tyne) the coal on one side may be 500 ft. lower than on the other, he then explaned the various terms to be used in the course of the lectures.

He observed that he would divide the carboniferous series of Great Britain into five heads, as follows:—1, Devonian culms; 2, South Wales coal district, and small coal district in middle England, including Staffordshire and Derbyshire; 3, the coal system of the north of England, including Yorkshire, Nottinghamshire, Derbyshire, Manchester, Durham, and Newcastle; 4, the Scotch; and 5, the Irish coal-fields.

The culm measures of Devonshire occupy a great hollow, or trough—the axis of which ranges from east to west, and extends about 50 miles. The irruption of granite and other volcanic matter has in various parts caused great disturbance of the strata. Some few obscure vegetable markings are found in the culm, but fossils are exceedingly scarce, and of these, as have been obtained, bear a close resemblance to those found in the true coal measures. The difference between those found and the fossils of the other carboniferous deposits in other parts of the country may have arisen from the manner in which the former were deposited; and the culm may be the representative of the magnesian limestone of the north. In the South Wales coal district, the coal rests on a series of conglomerates, called the millstone grit, beneath which coal is never found of any great value in Wales or the middle of England. In the north this rule does not hold good. The South Wales coal rests in a depression of the older rocks, in the shape of a basin. It extends about 90 miles along the coast, is 20 miles broad at its eastern extremity, but at the sea only about six miles. In the western part is found a nonbituminous coal, called anthracite. The number of seams is great, and they vary in thickness from 1½ feet to 8 feet: aggregate, 95 feet. The upper seams only are worked, where the coal can be obtained at small expense. The total thickness of the coal measures in South Wales is estimated at 12,000 feet; the number of seams of coal at about 100, nearly half of which are worked. Clay ironstone occurred in nodular masses, interstratified with the coal, and, although not by any means so rich in metal as that of other districts, is more valuable from the circumstance of the coal being obtained so easily and cheaply, and the mountain limestone, required as a flux to reduce it, being also close at hand.

Among the minor coal deposits, the lecturer instanced the coal-field of Somersetshire, caused by the old red sandstone having been pushed up by igneous action, and the carboniferous rocks thus taking the shape of coal; and a small coal-field near Shrewsbury, which was interesting, as being evidently a fresh water deposit, and was considered by Mr. Murchison as the youngest member of the carboniferous system. Another small coal-field occurs in Flintshire.

The Staffordshire and Worcestershire field came next under consideration—a deposit which, although small in comparison with others, was of the highest importance, since to the supplies of coal and iron from it Birmingham owed its supremacy as the seat of manufactures. It was that cause which had raised it from a mere village of blacksmiths to its present mercantile greatness; and it, combined with scientific knowledge, formed the only means by which that greatness could be retained. This town possessed resources much greater than other towns, which nevertheless are far before it in everything which constitutes true greatness, owing to the spread of knowledge among their inhabitants, and the avidity with which they had seized upon its treasures. Let the people of Birmingham adopt and act upon the conviction, that in proportion to the extent to which science flourishes there, so will it continue to be the seat of manufactures. (Applause.) He was happy to observe that there was every reason to hope, that an impetus had been given to the mind of Birmingham, which would impel it in the right course, and enable it to attain a deserved success. He proceeded to remark that the first attempt to describe the coal district of South Staffordshire was by Mr. Keir, in 1798; and nothing was added to that till Dr. Thompson's account published in the Annals of Philosophy for 1816. The coal-field was described by Kier to extend only about four miles round Dudley, whereas at the present day the area over which the coal extends is estimated at more than 100 square miles. From Stourbridge on the south to Rugeley on the north its length was 22 miles, and its breadth from east to west about nine miles. The lecturer then referred to a section of the field extending from Summer-house-hill on the west, to a short distance beyond Lord Dartmouth's pits on the east. He observed that, as the coal was found to dip under the new red sandstone near Sedgley, and as on the other side of the field it had been found by Lord Dartmouth's miners also under the new red sandstone, it was not too rash to suppose, that it might ultimately be found under the town of Birmingham. The Dudley coal-field is found surrounded by the new red sandstone, which, attains in many places an enormous thickness, and beneath which, till a late period the coal was not considered to extend; but, it has been found at the distance of one mile from the great fault, by which the coal was supposed to be cut off, by the sinkings of the Earl of Dartmouth, under the new red, on the eastern side, but how far profitable commercial enterprise can be pursued in that direction, is not fully decided, from the thinnings out of the coal seams.

On the western side shafts have been with success sunk under the new red sandstone, and the coal found to expand in thickness as it dips. It might be taken as a rule, that if the sandstone were the lower member of the new red, or Permian system, as it was called, it might be bored for coal with almost a certainty of success; but if the upper member, the expense would be immense, and it was doubtful whether the coal would ever be reached. The surface of the Dudley coal field was formed of clay, gravel, and boulders, the result of the disintegration of the sandstone and trap rocks, which pierce through the coal in various directions. Beneath this alluvium lay the coal measures, of which there were 11 seams, the main one of which measured 10 yards in thickness, being in fact a number of deposits separated by very thin seams of shale. This coal "cropped out" at Bilston, and extended across the southern part of the coal field. The deposits interstratified with the coal consisted of shale and ironstone, the paucity of sandstone being remarkable. The millstone grit, which forms such vast walls round the northern fields, was here scarcely represented; and the mountain limestone was altogether absent. There was reason to believe that those strata never had been deposited in this part of the country. The sub-strata were, therfore, Silurian rocks, which rise up irregularly through the coal near Dudley and Sedgley; and from its eastern boundary near Walsall.

The South Staffordshire field, is divided by the Sedgley, Dudley, and Rowley hills—the two former of limestone, and the latter of basalt. This ridge runs obliquely through the coal-field, from north-west to south-east, and the curious foldings, and twistings of the limestone, and shale around the hills, as may be seen, at the Wren's Nest, and Dudley Castle hill, show us, that they have been lifted up from beneath, by a force acting from below. This internal action may have been attended with the formation of the Rowley hills, which were ejected no doubt in a fluid state from the interior of the earth, and rising to the surface, dislocating, and otherwise altering, the coal measures spread out over their surface Hence the coal strata dip away from or rise to the opposite sides of the limestone, while they are continued under the basalt, being evidently charred or burnt as they approach the nucleus of the hills.

The lower coal measures and ironstone crop out from under the ten-yard coal, and extend into the Wolverhampton or northern portion of the South Staffordshire field, presenting, however, very different characters as they extend northward. Three courses of ironstone, of no very great value, have been found near Dudley, but at Wolverhampton 14 courses of valuable ironstone are wrought. It was hence supposed that the workings at Dudley did not go deep enough; but the fact was, that the miner was there acquainted with the very bottom of the field, which had been brought to the surface by the protrusion of trap and other igneous rocks. The greater scarcity of coal round Wolverhampton caused the richer iron ore of that district to be brought to Wednesbury, Sedgley, and other places in the south, to be smelted. The ten-yard coal invariably terminates at the foot of the limestone hills, as at Walsall, Sedgley, Wren's Nest, and Wednesbury. It extends around the basalt from near Oldbury to Hales Owen, where it again meets with, and is thrown up, by the limestone. Near Stourbridge many dislocations occur, and the progress of mining is much impeded by a peculiar volcanic substance called green rock, resembling basalt. Towards Sedgley, the ten-yard coal goes so deep that the mines cannot be worked. It is probable that the ten-yard coal extends westward into Shropshire, and eastward under the new red sandstone; but it was not likely that they would obtain it beyond Bilston to the north, or Stourbridge to the south. The ten-yard coal is found at various depths in different parts of the same field, owing to the dislocations of the strata. At Wolverhampton and Bilston it crops out, while at other places its position varies from 16 to 140 yards from the surface in a short distance. As the subjacent limestone and superincumbent new red sandstone have participated in the effects of these dislocations, it is evident that they were deposited before; that the coal was deposited horizontally on the Silurian rocks; and that the whole were upheaved at one time.

The North Staffordshire coal field resembled the south in the absence of the old red sandstone and the mountain limestone, and in its resting conformably upon the Silurian rocks. The ironstone found in the northern field was exceedingly rich, yielding 30 to 40 per cent. of metal. The coal measures extend in a triangular form, Newcastle-under-Lyme being the centre, and the area containing about 50 square miles. There are probably between 30 and 40 seams, varying in thickness from a few inches to 10 ft. The impressions of plants and fossil remains established the identity of the Staffordshire coal measures with the carboniferous rocks of other parts of England.

The lecturer then proceeded to give a brief description of the northern carboniferous deposits, and observed that he would divide them into 3 great divisions, although, in reality, they are continuous—1, Yorkshire, Derbyshire, and Nottingham series—2, Lancashire coal-field—3, Durham and Newcastle coal-fields. The base of the carboniferous system, is only displayed at two places in the north—viz., where the Cheviot hills pierce through, and bring to the surface the old red sandstone; and in the north-west, where in a manner somewhat analagous, the mountain limestone passes round the flanks of the Cumberland hills, and thence a sequence may be traced to the igneous rocks beneath. In Yorkshire, &c., we have a traced development of the mountain limestone, to which the highly beautiful and picturesque scenery of that county is due, the limestone is found capped by the millstone grit, and the coal measures. The seams of coal vary from two to five feet in thickness, occupying their usual place upon the top of the series; the coal is inferior in quality, to that of Newcastle; but it is of a bituminous nature. The Yorkshire deposits occupy an area extending north, and south, from a little above Leeds, to Derby, a distance of 65 miles; its nearest width in the north being about 23 miles, while at Nottingham it does not equal 12 miles. The total thickness of coal is estimated at 26 yards; it is separated from the Newcastle field, only by a thick covering of magnesian limestone, beneath which, no doubt, the coal extends from one to the other. The Lancashire coal deposit is separated from the above by a range of hills. It occupies an area in the southern division of Lancashire, in which Manchester may be considered the centre; it ranges 46 miles from north to south, and about 40 miles from W.S.W. to E.S.E.; it commences with the millstone grit, and extends upwards to the fresh water or Ardwick limestone, the highest member of the coal series in England. The total thickness of the formation is found to vary greatly; in some places the seams of coal, each exceeding a foot in thickness, are said to amount to 75—making an aggregate thickness of coal 150 ft. Many faults exist in this field—one carrying the coal 1000 yds. below its former level. The Lancashire field supplies Manchester, Liverpool, and the neighbouring districts with fuel. The deposits of Northumberland and Durham, comprising what is termed the Newcastle coal-field, extends from the River Coquet, on the north, to nearly the Tees, on the south; its length is about 58 miles, and its greatest breadth about 24; the seams of coal rest on the millstone grit and mountain limestone, with the usual alternations of shale, &c.; the aggregate thickness of the whole deposit varies much in different parts—in some cases equalling 1620 ft., in others much less; the ironstone, which forms so important a part in the southern fields, is here comparatively unimportant. The number of seams of coal may be considered as equal to 80, but their total thickness does not exceed 10 yds., although each of the beds worked average from 6 to 7 ft.; the coal is exceedingly bituminous, and the best yet discovered for domestic purposes. The Newcastle coal deposit may be estimated as covering an extent of surface equal to 960 square miles; this deposit, like the others, has been subjected to various disturbing forces, and a dike crosses the field in a straight line, extending more than 60 miles. The coal exists in a trough, and, therefore, in the centre, shafts have to be sunk to a considerable depth ere reaching the coal.

Mr. Onion then gave a slight description of the Scotch and Irish carboniferous formations, and, after noticing the extent and nature of the coal in the respective countries, remarked, with respect to Ireland, that, as she was struck less favoured than her sister isle in regard to her bituminous coal, she must

look to her anthracite, which exists in great abundance and in thick seams. Its decrepitation prevents its being used for household purposes, but, in regard to manufactures, it has many, and, we may say, important, advantages. It might, for instance, be used in a thousand ways, instead of that expensive material, coke, from which it differs but slightly, in reference to its chemical composition and properties. He also read several extracts from Dr. Kane's work on the *Industrial Resources of Ireland*—all tending to this end, that coal of the best quality could be obtained in Ireland at a cost not exceeding by more than one-half the average cost of fuel in the manufacturing districts of England. The lecturer then alluded to the coal deposits of France, Netherlands, the banks of the Rhine, in Saxony, &c., &c., and said, with regard to many of these places, as mines have not been worked, or, at least, only to a small extent, it is utterly impossible to say anything as respects the quantity or value of the coal; although, at Picton, in Nova Scotia, beds of coal, similar to the Staffordshire, are said to occupy an area of 100 square miles—one bed is described as varying between 30 and 50 feet thick; but not being equally good throughout, only 10 feet of the upper part is worked. In France the beds resemble much the carboniferous series of South Gloucestershire and Somersetshire, as developed in England. In the United States of North America immense deposits of coal, chiefly anthracitic, have been found. The lecturer concluded by drawing particular attention to the coal deposits of America.

Errata in the Report of Mr. Onion's First Lecture.—Instead of—"they might, as in this town, find the *old* red sandstone uppermost," *read*, "they might, &c., find the *new* red sandstone uppermost. Instead of—"19 of our most flourishing towns lie upon the *old* red sandstone,' *read*, "the *new* red sandstone."

Mining Correspondence.

ENGLISH MINES.

BARRISTOWN.—*Carrig Taghmon, Feb.* 13.—Since my last report we have been driving in the western end through a good course of ore, and the end still produces 3 tons per fm.; the end east, at this level, is still producing between 2 and 3 tons per fm.; the pitches, at this level, are looking well, improving in going south; the middle lode, eastern end, is in slide—poor. Nangles' shaft, up the hill, is looking much the same, producing 2 tons per fm.; the end east, from this shaft, produces about 2 tons per fm. We have driven on the lode in this end 5 fms.; the bottom of the level looks much the same, producing 2 tons per fm.; we have just commenced to drive west of this shaft on course of lode. We have 30 tons of lead ore dressed, ready for shipment.

BEDFORD UNITED.—Feb. 17.—At Wheal Marquis, we are desuing the lode in the 80 fm. level east. The lode in the 70 fm. level east is 18 in. wide, and worth 20*l.* per fathom; and in the stopes in the back of this level the lode is 2 ft. wide, and worth 10*l.* per fm.; the lode in the winze, in this level, is 18 in. wide, and worth 10*l.* per fm. In the 58 fm. level east there has been no lode taken down. In the 47 fm. level west, on the south lode, the lode is 15 in wide, composed of gossan, spar, and ore—worth 4*l.* per fm. At Ding-Dong there has been no lode taken down in the 24 fm. level west. At Wheal Tavis, took the lode in Phillips's engine-shaft is 2 ft. wide, composed of mundic, spar and ore. The lode in the 35 fm. levels, east and west, are without alteration. We are progressing tolerably satisfactory with the erection of wheel, &c., for trial of the south lode.—J. PHILLIPS.

CALLINGTON.—Feb. 16.—In the 100 fm. level, driving south of Johnson's engine shaft, the lode is improved, the back will set at 5*s.* in the 1*l.* on the value of the lead; the rise, in the back of this level, has been communicated with the winze sunk from the 90 fm. level. We have recommenced driving the 100 fm. level north, and have got through the hard cross branch; the lode has not been taken down. In the 90 fm. level, driving north, the lode continues of a promising character, giving out a large quantity of water—the back will pay for working at 7*s.* in the 1*l.*; driving south, at this level, the lode is producing silver-lead ores. At the north mine, in the 90 fm. level north, we have an abundance of water, with a very promising lode, leaving ground that will set at 5*s.* in the 1*l.*; the south end is driving through ground that will set at 6*s.* in the 1*l.* In the 80 and 70 fm. levels the lode continues productive, the backs will set at 10*s.* in the 1*l.* The pitches in the back and bottom of the last-mentioned level, on the copper lode, are looking very promising; men getting wages. Our next parcel of silver-lead ores will be ready for sampling shortly, it will be the largest we have ever had.—J. T. PHILLIPS.

CARADON WHEAL HOOPER.—Feb. 17.—We have been much delayed in cutting the platt, and sinking our pitwork, having had those works nearly four weeks in hand. This has been occasioned by the hard and tough ground we have had to cut through, and a large quantity of surface water retarding our progress: the shaft is still in killas, and I am happy to say we are now fast progressing towards our intended 80 fm. level,—where we shall intersect the lodes, and where there is every reason to hope that they will prove of value; the men are sinking at the rate of from 5 to 6 ft. per week.—J. SEYMOUR.

CONSOLIDATED TRETOIL.—The sumpmen have been engaged in the past week enlarging the plat at the 70 fm. level, and doing other necessary work, preparatory to sinking Henwood's shaft below that level. The lode in the 70 fm. level, east of Henwood's shaft, is 20 in. wide, producing good stones of ore, and opening ground for tribute; in the 70, west of ditto, the lode is 9 in. wide, producing a little ore; in the rise in the back of this level east the lode has not been taken down since last reported. The lode in the rise against Williams's shaft is 1 ft. wide, orey throughout. The ground in the 40 cross-cut south continues favourable for driving, and letting out much water; we are driving here with all possible speed. We hope, in about a week, to have all the pitwork drawn up from Russel's shaft—the greater part of which will be for sale.

EAST TAMAR.—Feb. 16.—At Whitson, in Hitchins's engine-shaft, the men have been engaged in putting in bearers, cistern, and heaving in the lift, also dropping a sinking lift, and forked about 4 fms. of water under the 36 fm. level; the lode is not taken down in this level, of which I shall be able to give a more particular account in our next report. The south shaft we have cleared and secured 6 fms. under the 30 fm. level, which is down to the water. At Furzehill, we are still clearing south in the 30 fm. level, where we are expecting to find ground very soon. At Charlotte's, Whitson, and Furzehill, the pitches are looking very promising.—B. ROBINS.

GREAT WHEAL MARTHA.—Feb. 14.—The new lift of pumps having been fixed in the old engine-shaft, the water will soon be got out to resume operations in the 90 fm. level east; this would have been done in the time mentioned in our last report, but for a breakage of the main rod. The lode in the winze, sinking in the 60 fm. level west, is 5 ft. wide, producing stones of ore. At the new mine, the lode in the 20 fm. level east is very large—hard, and at present poor; the lode in the western end is 6 ft. wide, strongly mineralised—regular, with very promising appearances. No material alteration has taken place in the 10 fm. level west; the ground set on tribute being developed, it produces ore as we anticipated, and the tributers are getting very good wages. The new engine-shaft is correctly holed by a winze—rose from the deep adit, 6 ft. by 3 ft.; the size of the shaft being 11 ft. by 7½ ft., we have set to cut down the remaining ground, together with dividing the engine from the whim shaft, fixing ladders, cutting platt, &c., &c. The engineers are busily engaged in fixing the engine.—J. PRINCE. T. PENALUNA.

GUNNIS LAKE.—Feb. 17.—At Chilsworthy, the lode in Bailey's engine-shaft is 3 ft. wide, composed of gossan and spar.—W. RICHARDS.

HAWKMOOR.—Feb. 17.—The lode in the south engine-shaft is about 15 in. wide, composed of spar and mundic, with spots of ore in places; in the western engine-shaft the lode is 15 in. wide, much as last reported. The lode in the 15 fm. level, west of Hitchins's engine-shaft, is 20 in. wide, and poor; in this level east the lode is improved, being about 1 ft. wide, producing saving work.—R. RICHARDS.

HANSON.—Feb. 16.—I beg to say at Treza we have cut Stainsby's lode at the 22 fm. level, at Stainsby's engine-shaft; the lode is 2 ft. wide, with some good stones of ore—a kindly lode. In the 12 fm. level, east of Stainsby's engine-shaft, on Stainsby's lode, the lode is 3 ft. wide, with some ore; the caunter lode, same level, east of Stainsby's engine-shaft, is 16 in. wide, with good ore through the lode. The lode in the rise against adit, west of sump whim shaft, is 20 in. wide, with some ore. At Hanson, our sumpmen are still sinking Hanson's engine-shaft, which shaft will, in the course of this week, be down to the 64 fm. level, immediately they will drive to cut Ribb lode. In the 54 fm. level, west of Hanson's engine-shaft, on Ribb lode, the lode is 18 in. wide, chiefly mundic. The lode in the winze, sinking under the 44 fm. level, west of Hanson's engine-shaft, is 3 ft. wide, unproductive.—Z. WILLIAMS.

HOLMBUSH.—Feb. 17.—The ground in Hitchins's shaft, sinking below the 110 fm. level, is still hard. In the 120 fm. level cross-cut the ground is also hard. In the 110 fm. level, west of Hitchins's shaft, the lode is 12 in. wide, producing stones of copper ore. In the stopes in the back of this level, west of Hitchins's winze, the lode is 12 in. wide, and worth 12*l.* per fm. In the stopes, west of the sump winze, the lode is 10 in. wide, and worth 11*l.* per fm. In the stopes, east of Doidge's winze, the lode is 9 in. wide, and worth 8*l.* per fm. In the 100 fm. level, west of Hitchins's shaft, on the north part, the lode is 16 in. wide, and worth 15*l.* per fm. In the 100 fm. level, west on the south part, the lode is 9 in. wide, and worth 8*l.* per fm.; the lead lode, south at this level, is 5 ft. wide, composed of soft spar, prian, and spots of lead. In the 90 fm. level driving north, on the lead lode, we have intersected the north part now wrought on at the 100 fm. level, the lode is 10 in. wide, composed of mundic, spar, and stones of copper ore; we had commenced driving west on it; in the 90 fm. level, driving south on ditto, the lode is 2½ ft. wide, composed of flookan, spar, and spots of lead. In the 62 fm. level north the ground is favourable for driving. In the rise in the back of the 80 fm. level, against Bray's shaft, the lode is small and poor.—W. LEAN.

LANIVET CONSOLS.—*Agent's Report.*—Since our last report, but little has been done in the bottom parts of the mine in consequence of so much water, which we have only been able to keep at the 60 fm. level; but, since the last two or three dry days we have had, it is again in fork at the 70, and, should the weather be a little favourable, we shall resume sinking Elizabeth's shaft on Monday. The 70 fm. level east and west are just as last reported. The 60 fm. level, east of Elizabeth lode, is about 4 ft. wide, 1 ft. of which is composed of flookan, prian, spar, and ore—the other part of the lode is capel; the winze, in bottom of 60, is more favourable for sinking, and looking more kindly for ore; this winze is a few fms. east of the 70 fm. level end. The cross-cut to the whim shaft is much more favourable for driving, and, within this last week, we have cut some branches which has let down a considerable quantity of water—consequently, we shall be able to sink the whim shaft shortly, which we must communicate to the cross-cut before we can resume the 40 end east.

SILVER VALLEY.—Feb. 16.—I beg to say, that the lode in the 30 fm. level, driving west, has just the same appearance as stated last week, being about 2 ft. wide, producing some good stones of tin work. The lode in the eastern end is 3 ft. wide, one half of which we are saving for tin work. The lode in the 20 fm. level east is 2½ ft. wide, composed of capel, spar, peach, and mundic, with some stones of tin and spots of copper ore in places. At the south shaft the men are getting on as fast as possible, in clearing and securing the shaft. We have secured the collar of the small shaft (which is 10 fms. north of the silver lode, or south shaft), and are now in course of clearing it, in order to drive east and west on the silver lode.—S. RICHARDS.

SOUTH WHEAL MARIA.—Feb. 17.—We are still going down with the engine-shaft; our ground is much improved. Last week we cut a rich branch of copper, running through the shaft to the lodes each side of it. A rich killas is now coming up, impregnated with greens, mundic, and copper. I think we are near one or more rich lodes. We have a pile of tin taken from the back of our north lode ready for the stamps, and, had we sufficient machinery to crush and dress it, a return of profit from the tin only, I believe, might be immediately realised.—JAMES CHANHALL.

TAMAR SILVER-LEAD.—Feb. 16.—The engine-shaft is sunk 2 fms. below the 145 fm. level, and the ground favourable for sinking. In the 145 fm. level the lode is 4 ft. wide, interspersed with ore throughout. In the 135 fm. level the lode is 2 ft. wide, composed of capel and ore, rich work; in the north end, at this level, the lode is small and poor. In the 125 fm. level the lode is 3 ft. wide, producing work of a promising character. In the 115 fm. level the lode is 6 in. wide, good work. In the 105 fm. level the lode is 9 in. wide, producing good stones of ore. In the 95 fm. level there has been no lode taken down since last report. We have holed the incline plane shaft to the 115 fm. level, and commenced drawing the tribute work. We sampled on the 6th instant 104 tons 13 cwt. 1 qr., of rich silver-lead ore. At North Tamar, in the 60 fm. level, the lode is 4 ft. wide, composed of capel, with strings of mundic. In the 50 fm. level the lode is 2 ft. wide, producing work of a coarse quality; in the winze, sinking in the bottom of this level, the lode is 3 ft. wide, composed of capel, mundic, and ore, saving work. In the 40 fm. level the lode is 6 in. wide, good work. At Wheal Hancock, we are still driving west, but no indication of the lode.—JAMES SPRAGUE.

TINCROFT.—Feb. 16.—We continue to sink the new engine-shaft, below the 90 fm. level, in favourable ground. The lode in the 90 fm. level east is 4 ft. wide, 2 ft. of which is orey, worth 8*l.* per fm.; the lode in the 90 west is 2 ft. wide, worth 8*l.* per fm. The lode in the 80 end east is 2 ft. wide, producing some ore, and kindly; the lode in the 80 west is 4 ft. wide, worth 30*l.* per fm. The lode in the winze, sinking below the 70, just before the last-named end, is 3 ft. wide, worth 30*l.* per fm.; the lode in the 70 end is 2 ft. wide, worth 10*l.* per fathom. The 60 and 50 ends east are producing fair quality tinstuff; the 60 and 50 ends west are at present unproductive. At Palmer's, the 70 fm. level west is producing some good quality ore. The 60 west is at present unproductive; on the north and south part our pitches continue to produce fair quality ores. In the south mine, stoping the bottom of the 152 fm. level, east from the engine-shaft, we have a good lode for tin, worth 40*l.* per fm.; the 152 east is worth 20*l.* per fm.; the 152 west is worth 20*l.* per fm. The 142 east is worth 15*l.* per fm.; the 142 west is unproductive. The 120 east is worth 12*l.* per fm. The 110 east is worth 4*l.* per fm. We are opening ground in all our levels (in the south mine especially) that will work at a moderate tribute.—WILLIAM PAUL.

TRELEIGH CONSOLS.—Feb. 14.—In Christoe shaft, below the 90, in the country, the ground favourable; in the 90, east of ditto, the lode is 3½ ft. wide, worth 38*l.* per fm.; in the 90, west of ditto, the lode is 15 in. wide, more kindly, with stones of ore. In Garden's shaft, below the 80, no lode taken down this week. In Good Fortune shaft, below the 70, the lode is about 3 ft. wide, with stones of ore; in the 70, west of ditto, the lode is 2½ ft. wide, more promising than it has been, with stones of ore. In the 60, west of Symons's, the lode is 20 in. wide, with some ore, and more kindly. In the 50 cross-cut north, the ground still hard; expect to be near the lode. In the 50, west of Symons's, the lode is 18 in. wide, producing stones of ore; in the winze, below the 44, the lode is 15 in. wide, but little ore. In the 34, west of ditto, the lode is 18 in. wide, unproductive; in the rise, above the 20, the lode is 2½ ft. wide, no mineral; in the winze, below the adit, the lode is 18 in. wide, producing some good ore.—WILLIAM SYMONS.

Calculation of ores, sampled on Tuesday last:—Wheal Christoe, 65 tons, produce 10⅜ per cent., 8*l.* 10*s.*—552*l.* 10*s.*; Good Fortune, 60 tons, 5⅜ per cent., 3*l.* 15*s.*—225*l.*; total, 777*l.* 10*s.*

UNITED HILLS.—Feb. 13.—In Williams's engine-shaft the lode is 2 ft. wide, worth 50*l.* per fm. In the 80 fm. level, east of Williams's shaft, the lode is 4 ft. wide, worth 20*l.* per fm.; in the 80, west of ditto, the lode is 3½ ft. wide, producing no ore. In the 70, east of eastern shaft, driving to cut the south part of the lode; in the 70, west of diagonal shaft, the lode is 3½ ft. wide, coarse in quality, worth 5*l.* per fm.; in the 70, west of James's shaft, the lode is 3 ft. wide, producing but little ore, worth 5*l.* per fm. In the 60, east of eastern shaft, the lode is 2 ft. wide, worth 12*l.* per fm.; in the 60, west of Harper's winze, the lode is 3 ft. wide, producing but a small quantity of ore, worth 4*l.* per fm.; in the stopes, bottom of the 60, east of Harper's winze, the lode is 3½ ft. wide, worth 30*l.* per fm.; in the stopes, bottom of the 60, west of James's, the lode is 6 ft. wide, worth 18*l.* per fm. In the 50 cross-cut south, no alteration in the ground in this cross-cut. At Wheal Sparrow, in the 50 fm. level, east of Gibson's shaft, the lode is 2 ft. wide, producing but little ore, worth 3*l.* per fm. In the 40, east of ditto, the lode is 2 ft. wide, worth 15*l.* per fm.; in the 40, west of ditto, the lode is 18 in. wide—poor. In the 30, west of Richard's shaft, the lode is 2 ft. wide, worth 6*l.* per fm.—THOMAS TREVENEN. ROBERT WILLIAMS.

WEST WHEAL JEWEL.—Feb. 16.—We expect the water will be out of the 100 fm. level in the course of a few days. In the 85 fm. level, west on Wheal Jewel lode, the lode is 1 ft. wide, worth 8*l.* per fm. In the 70 fm. level, west on ditto, the lode is 1 ft. wide, containing stones of ore; the ground in the south cross-cut, at the same level, is favourable for driving. In the 85 fm. level, west on Buckingham's lode, the lode is divided into two parts, both of which are unproductive. In the 30 fm. level, east on Morcom's lode, the lode is 3 ft. wide, composed of spar, mundic, and stones of ore. In the 12 fm. level, west on Tolcarne tin lode, the lode is worth 6*l.* per fm.; in the 12 fm. level, east on do., the lode is worth 6*l.* per fm.; in the deep adit, west on Wilkinson's lode, the lode is 18 in. wide, unproductive.—S. LEAN. R. JOHNS.

WHEAL PENCORSE.—February 10.—Since my last report the adit level, driving east from Bassett's shaft, on Carne's lode, has been poor for lead and jack for 6 fathoms driving; at present, the lode in the end is 2 feet wide, 6 in. of which are jack and spots of lead. The same level, driving west, is stopped in consequence of sinking a new shaft from the surface; the last 8 fms. driving; in this end we have had some very good stones of copper ore, and lead and jack, and sugar spar and mundic. Bawden's lode is poor for lead and jack. We are sinking a new shaft on the back of the east end from Bassett's shaft. Please to inform the adventurers of the report. We have driven east on Carne's lode from Bassett's shaft, by 4 men and 1 boy, 16 fms. for January. We have driven west on Carne's lode, by 2 men and 2 boys, 12 fms. 4 ft.; on Bawden's lode, by 2 men, 8 fms. The new shaft east is set to sink 10 fms. for 18*s.* per fm.; the new shaft west is set to sink 10 fms., or hole to the adit, for 15*s.* per fathom.—JOHN CHAMPION.

[FROM CORRESPONDENTS.]

CARN BREA.—The forty-eighth dividend, of 2*l.* per share (2000*l.*), has been declared, and is now payable to the shareholders in this mine. The prospects, we hear, are considerably improved—a new lode having been discovered 3 ft. wide, solid ore, worth 60*l.* per fm.! cost for driving only 30*s.*

EXMOOR WHEAL ELIZA.—This sett was inspected in December last, by a very efficient mining agent, who stated—"That the lode, where laid open in one place only, about 10 ft. deep, appears to be large; but I cannot state its exact size, being rather inclined to believe that it is divided in an easterly direction, and at this spot come together; the lode is, as I have before stated, large, and composed of gossan and iron, with stones of yellow copper ore in places, presenting indications favourable—rarely to be seen at a similar depth, and is, in my opinion, worthy of an effectual trial. I would recommend that the lode be costeaned, both east and west, for some distance in each direction, which will throw great light on this promising lode, and guide you in respect to future workings. The lode can be prosecuted with comparatively little expense—water-power being available to a large extent; on the whole, I would say, that I consider it a fair speculation, and worthy the attention of capitalists." Capt. G. Francis, on the 6th Feb., reports—"At this mine a lode has been opened at the surface, varying in size from 20 to 30 ft. wide, for upwards of 100 fms. in length, producing some fine yellow and grey ore, in the most promising gossan I have seen for many years; and the local situation, I would add, is all that could be desired—having a full supply of water-power all seasons of the year; in the centre of the sett 2½ miles long and one mile wide, and the sea coast being about eight miles from the mine.

WHEAL CHERRY.—They are driving an adit level 15 fms. below the present workings, in which they expect to intersect a lode in about a month from this time; the lode in the bottom is about 5 ft. wide, and very promising, containing copper ore and mundic. In costeaning, they have discovered another lode to the north, being about 18 in. wide, in which mundic and spar predominates.

GEORGE AND CHARLOTTE.—They are driving the adit on course of the lode by six men, which is composed of mundic, spar, blue killas, and ore, and considered a very promising lode.

LAMERHOOE WHEAL MARIA MINE still maintains her position in the opinion of practical men of what she will ultimately prove to be. There are already *eleven* lodes discovered, by means of costeaning, &c., and each of them promises well. It was decided on Monday last, where the engine and other shafts should be sunk, and two were immediately commenced, and it is anticipated that the lodes will be cut at the 20 fm. level by the time the engine is erected. A spirit of activity prevails on the mine, and it is to be sincerely hoped that the painful feeling of discord which has hitherto prevailed, will be forgotten in the pleasing anticipation of the future, and that all parties will be actuated by a feeling of unanimity in promoting legitimate mining.

MARKE VALLEY.—Among the various mines in the Caradon district we have to notice a most considerable improvement in this adventure. The mine, which is well situated to the north of Tokenbury and Yeoland, and north-east of the celebrated South Caradon, is in very few hands, and has been most respectably and perseveringly conducted. There are several lodes in the sett producing copper ore, but the operations are at present chiefly confined to two, Marke's and Sarum. The engine-shaft is sunk to the 65 fm. level, in which the lode is about 2 ft. wide—is producing good work, and leaving excellent tribute ground. Marke's lode, at the 50, is described as being lately improved greatly, and as kindly a lode as can be looked upon, producing can, spar, and some good bright yellow ore; in the western pitch the lode is looking very well, producing a better quality of ore, which will make a produce of 6½ or even 7. The same lode at the 40 is much improved during the last few days, and will now produce 3 tons of ore per fm.; a branch of very good ore has also been just discovered in the eastern pitch at this level, which will increase the price of the next sampling, as it is much better in quality than any ore previously raised from it. On the whole, there is good cause for congratulating the adventurers on the prospect they now have of meeting with a handsome return for the industry and patience displayed, and we are disposed to think this mine will add to the celebrity of this far-famed district.

ROSCARROCK.—The workings here are progressing most satisfactorily, and the lodes opened on, present a very encouraging character. The Crowner lode, it is expected, will be intersected at the 35 fm. level within a fortnight, and, as it produced fine stones of lead at the 5 fm. level, much is anticipated.

WHEAL BLENCOWE.—The engine-shaft is down to the 20 fm. level in a good strata for tin. In the 10 fm. level east, they have a very excellent course of tin; and, in sinking the winze west (10 fms. west of the end), they have a very good lode 3 ft. wide; in the western stopes, at the 10 fm. level, there is a good lode, worth from 15*l.* to 20*l.* per fm.; and in the eastern stopes they have a lode worth 30*l.* per fm.—from the 10 fm. level to the adit, it is calculated that they have 2000*l.* worth of tin discovered.

WHEAL CONCORD.—The boiler and other parts of the engine, in course of erection, have been received on the mine, and it is expected that the same will be completed in about a month. The lode was left in a productive state, and there is but little doubt the shareholders will be amply repaid for their outlay.

WHEAL EMILY.—It having been determined to abandon the workings at this sett, the shareholders are offered a like interest in a fresh undertaking, called "Larkholes,"—not far from the Caradons, and supposed to be on the same lodes—is immediately adjoining Wheal St. Cleer (shares now selling at 50*l.* each), and Victoria on the west (now quoted at 12*l.*) Larkholes has an advantage over Wheal St. Cleer in having water power, so that the lodes can be worked cheap. Much tin has been raised in this mine, and an adit has been commenced to come in under the old men's workings, which is driving rapidly, and is expected in a few days to intersect one of the main lodes of Wheal St. Cleer. Larkholes' lodes are likely to produce copper as well as tin; and, if so, the possession of the sett for tin to the exclusion of any person trying for any other metal, must give a preference for the copper grant; that for tin is for 99 years. The lines of both proposed county railroads run through this sett. The shares are offered by Mr. E. A. Crouch, of Liskeard, on the same terms as purchased, adding merely a sufficient sum to cover expenses, but which will cause the purchase-money to be only 45*s.* per 200th share, including the call of 20*s.* per share made to commence working the mine.

WHEAL MARY, in Calstock.—The lodes here have considerably improved, and much is expected in the next level. They are also in daily expectation of cutting the north lode.

WHEAL MAY.—The sett of Wheal May, situate in the parish of Blotes Flemming, near Saltash, in Cornwall, has just been taken up by a company, and divided in 1024 shares. The mine, from its geographical position, presents peculiar advantages for the transport of its ores, being situate on the navigable River Tamar, while the Plymouth and North Cornwall Railway is proposed to cross the estate. From the agent's report, we find that the sett contains three copper lodes, which have been opened on the backs, and are composed of gossan, quartz, mundic, and spots of copper ore. There is also a silver lead lode within the sett, which is considered promising: an adit is now being driven to cut the lode at about 20 fms. under surface. Tamar Consols adjoins this sett, which company are erecting smelting houses for their own ores, and those of the adjoining mines, which will save the large cost of transporting them to the usual smelting markets.

WHEAL WALTER.—Operations were commenced here on Wednesday last, and the various lodes have been since opened on, to ascertain their course and underlay, with a view to determine on the most eligible site for the steam-engine, as it has been decided on erecting one immediately. This is entering into mining with a true and proper spirit, for the lodes fully warrant an efficient trial, and delay is a waste of money. This sett is about two miles north of Wheal Maria, and the lodes at the surface are composed of calcareous spar, with flookan, a large proportion of mundic, and strongly impregnated with copper ore. The strata is soft blue killas, and the lodes from 4 to 6 ft. wide.

CORNUBIAN MINING COMPANY.

An adjourned special general meeting of the above company was held at the offices, on Monday, the 16th inst.—PETER STAINSBY, Esq., in the chair.—The CHAIRMAN read the advertisement convening the meeting, and the minutes and resolutions of the special general meeting, held on the 2d inst., which the present meeting was called to rescind or confirm. He then read the draft of a resolution which it was intended to propose, confirming the former resolution for the dissolution of the company; but, previous to putting the same, he would be happy to answer any question the shareholders present might wish to put; on which Mr. SCOTT (who said he represented several absent shareholders, and who was the seconder of the resolution for the dissolution at the previous meeting), wished to be informed, what were the prospects of the proposed new company; when it appearing that the chairman was largely interested in an adjoining sett, called Mineral Bottom, Mr. SCOTT said, had he been aware of that circumstance, he would not so readily have agreed to the dissolving the company.—Several proprietors seemed to think the circumstance should have been named previous to passing the resolution; at the same time, the CHAIRMAN expressed his readiness to transfer the sett to any new company that might be formed, and, in answer to an inquiry, said about 600*l.* to 700*l.* had been expended in driving the adit, in doing which they had discovered several lodes, and the reports of several mine agents had spoken favourably of the indications.—A long conversation then ensued, relative to the adjournment of the meeting for a fortnight, and, in the meantime, forming a committee of five shareholders to investigate the accounts and prospects of forming a new company, and to report their proceedings at the proposed adjourned meeting, which, after considerable discussion, was agreed to, and resolutions to that effect were passed—five shareholders present being named to form the committee.—The resolutions were—"That this meeting be adjourned to this day fortnight, then to meet at the office of the company, at 2 o'clock in the afternoon;" and "That five shareholders be appointed a committee to inquire into the affairs of the company, and particularly in relation to the situation of the Ventongimps Mine, the West Ventongimps mining ground, the Mineral Bottom mine, and also the adjoining property, north and south of Ventongimps Mine, and to report thereon at such adjourned meeting."—Some doubt having been expressed as to the legality of their proceedings, Mr. PLUMPTREE (the solicitor to the company), was appealed to, and he satisfactorily explained that, by the wording of the advertisement, which he would particularly attend to, their proceedings would be strictly legal.—In answer to inquiries, the CHAIRMAN said that all expenses at the mine had ceased, with the exception of watching the materials, and that the arrears of calls were the same as last reported—about 200*l.*—There being no other business before the meeting, a vote of thanks was passed to the chairman, and the meeting separated.

GREAT WHEAL WILLIAMS MINING COMPANY.

At a general meeting of the adventurers, held at the Prince George Hotel, Stonehouse, near Plymouth, on Monday, the 2d inst.—Captain WM. ATKINSON, R.M., in the chair,—the accounts, as under, having been audited, were passed and signed:—

DR.—Balance in hand 1st Dec., 1845			£128	6	7
Amount of call on the 11th August, unpaid			104	10	0
Ditto on the 29th Dec., 1845			256	0	0— 488 16 7
CR.—Labour cost and merchants' accounts to end of Dec.			£163	6	11
Amount of call 11th August, on 70 shares			35	0	0
Amount of call on 29th Dec., unpaid			214	5	0
Balance in hand			77	4	8— 488 16 7

It was resolved,—That the parties not having paid up their calls, made on the 11th August last, be informed, that, unless paid within 14 days, such shares will be absolutely forfeited.—That Mr. Edgcombe be requested to send in his claim for amount of damage done the land in Cross Parks, and the same to be referred to the next meeting.—That 40 fathoms of iron rails be purchased for the use of the mine.—[We published the report in last Journal.]

WEST WHEAL MARIA.—A meeting of adventurers was held at Tavistock on Friday, 13th inst., when it was resolved to erect a steam-engine immediately.

SOUTH WHEAL TRELAWNEY MINING COMPANY.

At a general meeting of adventurers held at the White Hart Inn, Menheniot, on the 5th inst.,—WILLIAM GLENCROSS, Esq., in the chair,—the accounts were presented, showing the cost for Oct. as 40*l.* 8s.; Nov., 69*l.* 10s.; Dec., 105*l.*—together 214*l.* 18s. By call of 1*l.* per share (less not received 10*l.*), 246*l.*—leaving balance in favour of company, 31*l.* 2s. The accounts were approved, and a call of 4*l.* per share made, payable before the 7th March, to the purser, or to Mr. Thomas Hackett, Birchin-lane: and it was also resolved, that Mr. G. Raby be paid on the 25th March 500*l.*, being the first of two payments of that amount as agreed for granting the lease to the present company;—that it is not expedient to continue the accounts opened with the East Cornwall Bank;—that all money for calls, ore sold, &c., be paid over to Mr. Thomas Hackett, of London, by whom all moneys required for cost, &c., be remitted to the resident purser through the East Cornwall Bank, in due time for payment, he (Mr. Hackett) being previously provided by the purser with the cost-sheet, bills, &c.;—that in case the purser neglects or refuses, or from death, resignation, or other incapacity, does not call a special general meeting when required, as provided by a resolution on the 17th of October last, three or more shareholders, holding collectively not less than 20 shares, shall have power to call a special general meeting;—that the lease from George Raby to Messrs. H. B. Rye, T. P. Thomas, Thomas Hackett, and John Harvey, on behalf of the company, be deposited in the East Cornwall Bank, Liskeard, in the names of the lessees, to be delivered up on the joint written authority of the above gentlemen, or to the survivor or survivors of them;—that the purser do not receive or register any notice of transfer of share or shares on which any calls made shall be unpaid, whether the date of the transfer be before or after the date of making such call;—that general or special meetings of the shareholders be held at the discretion of the purser, but not exceeding an interval of three months;—that 14 days' notice, at least, be given of all special or general meetings, such notice to be sent by the post;—that Mr. William Lean be appointed superintendent, at a salary of 2*l.* 12s. 6d. per month, commencing with Dec. last;—that Mr. Mark Matthews do retain his situation on trial until the next meeting;—that Messrs. Rickard and Prideaux be appointed surgeons to the mine.

WEST WHEAL KEKEWICH CONSOLS MINE.

At a meeting of the shareholders, held at Webb's Hotel, Liskeard, on Monday, the 2d inst.—Mr. JOHN GILES in the chair,—the purser having produced the accounts, showing the expenditure for working the mine for the last four months, ending Dec., 1845, to be 220*l.* 12s. 8½d., and the receipts 217*l.* 12s., leaving a balance against the shareholders of 3*l.* 0s. 8½d.—The following resolutions were carried:—"That the accounts be passed, and ordered to be discharged."—"That those shareholders who are in arrear of calls be written to by the purser, to request immediate payment, or their shares will be forfeited to the company."—"That the purser having received a communication from Dr. Mitchell, that some fields adjoining our sett, which he was empowered by the last meeting to apply for, were promised to another party, and having ascertained that that promise was made to the East Kekewich Company," it was resolved, "That the purser be instructed to endeavour to effect an adjustment of the said fields; and if the same can be done by bartering some fields in our sett, which we deem would be advantageous to the East Kekewich Company, on equal terms, the purser be empowered to conclude such arrangement."—Capt. BENNETTS being requested to state the present working of the mine, said that the ground continues favourable for driving, and the next take will not cost more than 2*l.* per fm., and that it is necessary a whim should be made in readiness for working by the time the adit extends to the shaft. Such whim would not cost more than 20*l.*—It was then resolved, "That Capt. Bennetts' statement as to the working of the mine being considered satisfactory, the whim be ordered accordingly,—"That a call of 5s. per share be made payable on or before the 1st day of March next;" and "That the future working of the mine be let by public survey, and that the clerk be instructed to issue notices to that effect."—It was proposed by Mr. LAMBERT, seconded by Mr. J. LOBB, and carried unanimously, that the best thanks of this meeting be given to Mr. Giles, for his kindness in taking the chair, and his conduct therein.

WHEAL BUCKETTS MINING COMPANY.

At a numerously attended meeting of the adventurers, held at the account house, on Monday, the 16th inst.,—WILLIAM GILL, Esq., in the chair—it was resolved that the accounts to the end of January having been entered, be allowed, and that a deposit of 5*l.* per share be at once paid to the bankers, Messrs. Ricketts and Co., Truro, or to the purser, to the credit of the adventurers.—The following report was read by the CHAIRMAN:—"Since our last meeting—viz., 26th Dec.—we have been very much occupied in clearing and securing the levels, and removing the dam from the cross-cut between the engine-shaft and Buller's shaft, at the 32 fm. level; we have fixed the 16-inch plunger, and finished casing the engine-shaft. At the 20 fm. level we have cleared and secured about 40 fms. At the 32 fm. level we have cleared and secured about 50 fms. Have cleared and secured Buller's shaft to the 32 fm. level, and cased and divided the footway to that depth. We are now driving the 20 fm. level east at 65s. per fm.; the lode is about 15 in. wide, of a promising appearance, producing tin and copper ore. We are driving the 32 fm. level west at 33s. per fm., lode poor; we are driving the 32 fm. level east, the lode is 18 in. wide producing very good ore. About 15 fms. west of Buller's shaft, in the bottom of this level (32), we have broken some good stones of ore, and, from appearances, believe there is a good course of ore gone down, but shall not be able to do much on it before we intersect the lode at a deeper level, which we expect in about four months to accomplish. We found the engine-shaft below the 32, completely filled with iron, timber, and rubbish; we have cleared 7 fms., and hope this week to accomplish clearing the remainder, when we shall commence driving the cross-cut will all expedition. We have 16 men working 7 tribute pitches, varying from 7s. 6d. to 12s. in the 1*l.* tribute. The whole of the stuff cleared from the bottom of the 20 and 32 fm. levels, we are dressing for tin and copper ore. The appearances of the lode in the 32, induce us to expect something good at the 44. Our cost, in future, will be considerably less per month, having now got the mine in a good state of working. We have 20 tons of good ore at surface."

STRAY PARK AND CAMBORNE VEAN.—We gave the particulars of the general meeting in our last; the report presented thereat was very favourable—the sump shaft is sunk to the 180 fm. level, from whence a cross-cut is in course of extension to intersect the lode, which they anticipate seeing daily. In the 150 fm. level east the lode is 3 ft. wide, worth 30*l.* per fm.; the 150 fm. west, is 1 ft. wide, worth 8*l.* per fm. The 120 west is 1½ ft. wide, worth 25*l.* per fm. The 110 west is 3½ ft. wide, worth 16*l.* per fm. The 100 west is 3 ft. wide, worth 20*l.* per fm. The 90 west is small and poor. The 80 west is 3½ ft. wide, worth 50*l.* per fm. In the 70 fm. level west the lode is small and poor.

WHEAL WILLIAMS—DUCHY OF CORNWALL.

SIR,—Notwithstanding the kind of threat made by your correspondent, "A Cornish Miner," I will venture a remark or two upon the subject to which his letter refers, although I am not connected with the Duchy, directly or indirectly. There are two modes by which a truth may be stated—one by putting it in plain, simple, and intelligible language, such as will convey the facts in the most unequivocal manner, and will speak clearly to the understanding of those who may read it without requiring note or comment; the other, by withholding such portions of the case as may suit the purpose of the writer, and by substituting them by comments intended to convey an impression prejudicial to the parties concerned, for the purpose of answering a particular object, and yet stating the mean facts much as they may have occurred. The case referred to by "A Cornish Miner" should have been placed before the public in a plain and simple manner, if it were considered to be worth noticing at all; but your correspondent, for some cause or other, has thought best to throw a little degree of suspicion upon the transaction, and to insinuate that the officers of the Duchy of Cornwall have gone out of their way, by taking advantage of circumstances which existed at the time, to impose terms upon the lessees of Wheal Williams (the mine in question), which were unexampled and unworthy of the grantor. Let me, however, place the matter upon (what I understand to be) the simple truth of the case. Wheal Williams is a mine immediately adjoining Wheal Maria, which has made such a stir in the mining world. It is expected that Wheal Maria lode will run through Wh. Williams, and, in consequence, it was deemed to be a very valuable speculation; so much so, that, I believe, the Duchy received more than 20 applications for a grant of it, and, in a great number of instances, from parties of equal respectability and responsibility. The Duchy officers, as men acting for others, and holding a very responsible situation, would naturally conclude, from the anxiety expressed by so many parties to obtain the grant, that there was something more than ordinarily inviting in this piece of ground; and being unwilling to show any preference for one party over the other, or to decide upon the merits of the piece of ground in question, by naming the terms upon which it should be granted, in justice to both lessor and lessee, placed the matter upon such a footing as would best enable the applicants to express their own opinion as to the value they respectively set upon it. The Duchy named 1-12th royalty, which was, I think, pretty indicative as to the terms they were willing to grant upon, leaving to the parties applying for the grant to decide for themselves, respectively, how much more they might be willing to give. Now, under the circumstances in which the Duchy officers were placed, surely there can be nothing so very outrageous in their having put the mine to a competition between the respective applicants for it. It is not, therefore, true, that the officers reserved "1-12th dues, and *thirty per cent. of the profits.*" They only reserved 1-12th dues, and the successful competitor *offered thirty per cent. of the profits* in addition, and if the highest offer had been 5 per cent., or 1 per cent., it would have been accepted. Who, then, is to blame for having concluded the contract upon such high terms? Or, how can the officers of the Duchy be said to have taken any undue advantage of the parties applying for the sett, or of the party who was successful in obtaining it? "But, by this participation in the profits, the grantor of the sett has actually become a *partner in the mine, and liable for the supplies and debts of the same.*" Is "A Cornish Miner" really in earnest, when he makes such an assertion? Has he overlooked the fact, that it is a rent charge as much as the royalty is, only in another shape? The lessor is not a partner—he does not agree to pay any part of the loss in any shape, nor can he be held liable for it in any wise—he only takes a portion of the profit when profit was made. Suppose that the lessor chose to agree to take no royalty upon the ores in the usual way, but would be satisfied to take a portion of the profits only, in lieu thereof, would that make him a partner? It would be a reservation made by himself as a remuneration for making the grant; and the only difference would be, that a royalty upon the produce would insure an income if any ores were returned, whether the mine were a profitable or a losing mine, whilst a share of the profits can only arise from a profitable mine. The Duchy officers might have put the mine to competition between the applicants for it, by inviting the parties to name the highest royalty they might be willing to give, and thus have secured the largest amount without a reference to profit; but, in my opinion, they have acted much more liberally by naming a moderate rate of royalty, and permitting the competition to be upon the share of profit to be given. It appears to me, that they have proved, by this arrangement, that they did not wish to take advantage of the parties applying for the sett. I have understood that the grant was awarded to parties principally residing at Truro, and I observe that your correspondent dates his letter from Truro. As soon as it was decided which was the successful party, I have heard that the London brokers were supplied with shares to sell at a pretty high premium, but that they declined to have anything to do with them, not liking the terms upon which the mine was taken. Are the lessees disappointed in their expectations?—and having found out that they have made a bad bargain, would throw the onus of their miscalculations upon the Duchy officers? If such be the case, and it looks much like it, I think they have met with their deserts, and are likely to find more of their error the further they proceed. The mine has been foolishly run up in value, and the lessees have undertaken a job that will not afford a very large sum from the profits, although 30 per cent. is to be the portion.—TRUTH: *London, Feb.* 17.

MINING IN CORNWALL—SPIRITED WORKING.

SIR,—Knowing your wish, that the readers of the *Mining Journal* should be in possession of all mining information, I have taken leave to send the inclosed *printed* announcement, if you think it worth the space, for insertion—it appears to me a perfect "original." AN OLD ADVENTURER.

"SIR,—Please answer my circular of the 25th ult., by paying the amount of your call—otherwise the merchants will not credit us for a pound of candles, or the labourers sink a costeaning pit, if they are to have no pay.

"I am, Sir, your truly *weary* servant, ——"

DR. CLANNY'S SAFETY LAMP.

SIR,—I have read, with no little astonishment, a tirade, signed "An Underviewer," against me and my safety lamp, in your Journal for Saturday, the 14th inst. I hereby pledge my word, that, if that individual will give his proper address in the *Mining Journal*, I will, without delay, refute every word in his communication to the said Journal. Should he not do so, I only remark, that the community will readily understand the meaning of the old adage—

Qui male agit odit lucem.

Trusting that, in common justice, you will give this letter a place in the next *Mining Journal*, I remain, &c., W. REID CLANNY: *Sunderland, Feb.* 17.

WHEAL TREVAUNANCE.—In the Stannaries' Court held at Truro, last week, before the Vice-Warden (J. L. Dampier, Esq.) the rule obtained for a new trial in the case of Carter and Others *v.* Enys, was confirmed. At the last sitting of the court, a verdict for the plaintiffs, with the recovery of 215*l.* 17s. 4d., alleged to be due to the defendants as tributers for working Wheal Trevaunance Mine, in which Mr. Enys was alleged to be the sole adventurer. Subsequently, Mr. Roberts, on behalf of the defendant, obtained a rule *nisi* for a new trial on the ground that the verdict was against evidence, the jury having, he contended, misunderstood some portion of the evidence, and been puzzled by the novelty of the case. Mr. Stokes having showed cause against the rule, Mr. Roberts and Mr. Hockin replied, after which the Vice-Warden said his own opinion was that it would be more satisfactory to submit the evidence to another jury, as it was possible some technical words made use of in the evidence might have been misunderstood.

PENTYRE LEAD MINE.—In the Stannaries' Court, Mr. Stokes applied, on petition, for an injunction, to restrain the sale and removal of the materials of Pentyre Lead Mine, in the parish of St. Minver. The petitioners, Messrs. Samuel and John Harris, were creditors, for working the mine in question, to the amount of 15*l.* 15s., and they stated that last Saturday the men were discharged, and that the captain, Mr. William Bishop, said that the purser, Mr. Stephens, was expected down in a few days to sell all the materials. They further stated that within 21 days, the captain said there would be nothing left on the spot; and that their debts were consequently in danger of being lost. The injunction was granted.

WHEAL CALSTOCK.—This mine is situate in the parish of Calstock, and is held under the Duchy. The present shareholders hold 600 shares; but it is intended to increase that number to 900, the 300 to be sold at 8*l.* per share, and the proceeds to be applied for working the mine, and, according to the constitution of the company, decided at a general meeting, held at Callington, on the 13th Dec. last, no original shareholders can sell a share, and the purser is prohibited from receiving a transfer of share or shares until the 900 are disposed of.—The sett is an extensive one, being one mile in length, and about three quarters of a mile in breadth, and, according to the reports which have been from time to time presented, contains many valuable lodes.—The 900*l.* to be raised from the sale of the 300 shares will, it is presumed, work the mine for 18 months or two years, and allow a shaft or shafts to be sunk on the course of the lodes, and an adit to be driven to cut the lodes 50 or 52 fathoms deep, leaving the same number of fathoms in backs to be worked without any additional machinery until it is thought necessary to go deeper.—According to the reports, it appears that nine good lodes have already been discovered, and these it is believed may all be reached, or made available, by driving from the shaft or shafts, about to be sunk. In reference to this mine, the following report has been furnished by Capt. Edwards of Birch Tor, who visited it on the 11th inst., and who thus writes to Messrs. Tyeth and Luscombe:—"There are nine parallel east and west lodes discovered, the whole within the distance of 100 fathoms. They vary in size from 2 ft. to 9 ft., all carrying good gossan backs, with good stones of copper ore, mixed with mundic and fluor spar. Several hundreds of tons of copper have been raised from a sett to the east of this on two of the lodes. The ground in that sett was hard, but as the lodes pass into Wheal Calstock the ground becomes more congenial, and I fully believe they will make large deposits of copper. An adit level can be brought in 50 fathoms deep, and as this level will intersect several cross courses which keep the water to the surface, even on the top of the hill, I have no doubt that copper in large quantities will be found without the aid of much machinery. On the whole, I consider the sett a very good one, and I do not know of another speculation so good in the neighbourhood."—*Plymouth Journal.*

ADVANCE OF WAGES.—The iron trade is in a flourishing condition, and, as a consequence, wages are better. We have been given to understand that T. Brown, Esq., the manager of the Ebbw Vale and Sirhowy Works, has given his workmen the benefit of the improvement, by raising their wages 10 or 12 per cent.—*Monmouthshire Merlin.*

NEW COLLIERY AT CHEVINGTON.—An extensive colliery is contemplated to be opened out by Earl Grey on his estate at Chevington, the produce of which, said to be calculated on an annual vend of 40,000 Newcastle chaldrons, will be shipped at Warkworth Harbour by means of the branch line, now before Parliament, of the Newcastle and Berwick Railway.

BREACH OF THE COLLIERY ACT.—On the 13th inst., Mr. John Topping, coal proprietor, Hindley, was summoned before the county magistrates, at the Townhall, Wigan, to answer six different informations, charging him with employing and permitting numbers of women to work in his colliery, contrary to the provisions of the above act. Mr. Ackerley, solicitor, appeared on behalf of Mr. Topping. The first case taken was that of Ellen Hughes. After hearing the evidence, the magistrates convicted the defendant in the penalty of 5*l.*, when Mr. Ackerley said he thought his client would take warning by the present conviction, and he hoped the other cases would not be proceeded with. His client had no objection to pay the expenses in the six informations. After some consideration the bench consented to Mr. Ackerley's suggestion.—*Liverpool Mer.*

MINE ACCIDENTS.

Wheal Nut.—T. Andrew was killed while working at the stamping mills.

Wheal Gray.—H. Richards was killed by falling from the 20 to 35 fm. level.

Shotton Moor Colliery.—C. and J. Brown (father and son), were killed while being lowered to their work—the accident was caused by a link of the chain, which was nearly a new one, having been broken.

Union Pit, Seaham.—J. Mason was killed by a premature explosion.

Blaenavon Iron-Works.—J. Williams, underground haulier, was killed here.

Onllwyn Works, Cadoxton, Swansea.—R. James was killed by a fall of coals.

Bunker's Hill, Bilston.—J. Fieldhouse was drowned at Mr. Badger's Works.

Whiteheath, Rowley Regis.—T. Jeavon, a "doggy," was killed by a fall of coal while engaged superintending the workings in Mr. Hacket's colliery.

Alston Moor Works, Cumberland.—Mr. J. Thompson, late manager of the Hodbarrow Iron Mines, Millom, died suddenly when about commencing his labours at the above works.

Furness.—As P. Nelson, aged 13, was engaged in the mines separating the ore from the dross, he got his leg and foot so seriously crushed by the machinery, as to occasion his death, after a short suffering.

Mosely Hole, Wolverhampton.—J. Freeman was killed by an explosion of sulphurous gas whilst working in a store pit in Mr. North's field.

Bunker's Hill, Porto Bello.—J. Fieldhouse was killed by the breakage of the pit rope while putting down a pit some cast-iron pump trees.

Oakfield Colliery, Porto Bello.—R. Davis fell down the shaft and was killed.

Otter Bed Colliery, Wolverhampton.—R. Palmer, horse driver, was killed here.

THE COAL TRADE OF AMERICA—IN 1845.

[Chiefly compiled from the *Miners' Journal.*]

The following is the official quantity of coal sent to market from the different regions in 1845, compared with 1844:—

	1845.	1844.	*Increase.*
Schuylkill	1,083,796	839,934	243,862
Lehigh	432,080	377,821	54,259
Lackawana	269,469	251,005	18,464
Wilkesbarre	178,401	114,906	63,495
Pinegrove	47,923	34,916	13,012
Shamokin	10,000	13,037	—
	2,021,674	1,631,669	390,005

The Schuylkill region still maintains the position she has held since 1832, in furnishing more than one-half the supply of anthracite coal sent to market. Since the trade commenced, in 1820, up to the beginning of 1846, the supply—

From all sources, amounted to *Tons*	13,467,302
Of this the Schuylkill region furnished	7,392,744
All other regions only	6,074,553
In favour of the Schuylkill region	1,318,136
During the last year our county furnished	1,181,732
All other counties only	889,952
Excess in favour of Schuylkill county *Tons*	241,770

The following is the quantity of coal imported into the United States from June 30, 1821, to June 30, 1845, both inclusive, in tons of 28 bushels, obtained from the official documents at Washington, together with the quantity of anthracite sent to market annually during the same period:—

Years.	*Foreign.*	*Anthracite.*	*Years.*	*Foreign.*	*Anthracite.*
1820	—	365	1833	92,432	485,865
1821	22,122	1,073	1834	71,626	376,636
1822	34,523	2,240	1835	49,969	536,835
1823	30,433	5,823	1836	108,432	696,526
1824	7,228	9,541	1837	153,480	874,389
1825	25,645	33,699	1838	129,083	723,836
1826	35,665	48,115	1839	181,551	817,689
1827	40,257	61,567	1840	162,867	865,414
1828	32,302	77,413	1841	155,394	956,566
1829	45,393	110,403	1842	141,521	1,108,001
1830	58,136	174,734	1843*	41,163	1,263,539
1831	36,509	176,820	1844	87,073	1,631,669
1832	72,978	368,871	1845	85,776	2,021,674

* Only for three-fourths of a year—the time for closing the year being changed from Sept. 30 to June 30.

From the above it will be seen, that, at the commencement of the trade, in 1820, only 365 tons were sent to market. In 1830, the quantity had reached 174,734 tons; in 1840, 865,414; and in 1845, 2,021,674 tons—so that the trade has more than doubled within the last five years. The total produce for the entire period being 13,467,302 tons.

To give our readers an idea of the extent of business transacted by the respective firms engaged in the Schuylkill coal trade, we subjoin a list of those whose operations exceeded 10,000 tons in this year. It will be seen that several have done a large business, and that two have exceeded the quantity mined and shipped by the Delaware Coal Company—the only incorporated company engaged in mining coal in that region. The Messrs. Heilner purchased and sold about 20,000 tons, in addition to the 72,000 tons mined during the year:—

M. G. and P. Heilner	72,097	Samuel Sillyman	21,585
Milnes and Haywood	69,805	George Spencer and Co.	19,991
Delaware Coal Company	69,035	William Milnes and Co.	19,858
Gideon Bast	55,317	Hewes, Baber, and Co., about	18,000
William Payne	43,825	Joseph G. Lawton	16,498
Thomas C. Williams	38,451	J. Cockhill	16,305
Charles M. Hill	38,022	A. B. White	16,111
George H. Potts	33,171	Charles Miller	15,881
James C. Oliver	32,194	George Rich	14,672
A. Ronaldson	26,213	Spayd and Luther	13,097
Joseph F. Taylor	23,195	L. G. Dougherty	12,639
Thomas Petherick	22,923	R. Kear	12,148
John Pinkerton	22,367	M. Morgan and Co.	10,358
M. Weaver	10,049.		

While nine establishments numbered between 10,000 and 6000 tons; five over 5000; nine over 4000; five over 3000; seven over 2000; and the lesser operations are embraced as "Sundries." The entire number of operators engaged in the region, who send coal to market, being about 100—of whom 27 shipped over 10,000 tons; 41 over 5000 tons, and the remainder less than 5000 tons. It is a curious fact, that, as the expenses of mining increase, the number of shippers decrease—owing to the smaller operators finding it better to answer their interest to sell the coal to the more extensive firms at the pit's mouth.

Annexed is the quantity of coal imported into Boston during the last 6 years:—

Years.	Anthracite. *Tons.*	English. *Chaldrons.*	Provinces. *Chaldrons.*
1845	165,422	12,156	33,628
1844	134,120	7,278	20,334
1843	111,655	5,490	20,184
1842	86,582	9,892	21,890
1841	107,095	11,396	30,029
1840	68,870	9,928	30,070

A considerable portion of the English coal is consumed in English steamers, which arrive at Boston, and is, therefore, exported again. During the last year the quantity so exported exceeded 11,000 tons.

PROGRESS OF STEAM IN THE COAL BUSINESS.

The number of engines engaged in the colliery operations in the Schuylkill region, up to the beginning of 1845, was	41	
Aggregate horse-power	1278	—
Built during 1845, in Pottsville, for colliery purposes	—	17
Aggregate horse-power	880	—
Ditto in Minersville	—	10
Aggregate horse-power	360	—
Total	2018	68

Making the total number of stationary engines engaged in the trade 68, with an aggregate power of 2018 horses—27 of which, with an aggregate power of 740 horses, having been added during the last year.

There were also five other engines built in Pottsville during the year, with an aggregate power of 235 horses, for other purposes. They were turned out as follows:—

	Engines.	*Horse-power.*
Messrs. Dehaven, Minersville	10	360
Haywood and Snyder, Pottsville	10	320
E. W. M'Glanis, ditto	13	295
Total	33	975

The same establishments have no less than 15 engines now in course of construction, and we learn there are two or three building at Port Carbon. We need only remark, that the engines turned out in this region are excelled by none others built in the country.

From an elaborately-compiled census of the towns in the coal region, we find a population of 14,036 depending on the coal traffic; besides several colliery establishments, or towns, numbering upwards of 800 persons each.

SOUTHERN AND WESTERN MINING COMPANY OF IRELAND.

We stated, in our last Number, that the shares in this company had been allotted, and that the demand exceeded the possibility of supply by 5000 shares. This great demand for shares, in the present depressed state of the money market, and the general distaste for speculation which the panic of last year has necessarily occasioned, is the best evidence that could be adduced of the general confidence in the productiveness of Irish mines, in the certain field of remunerative enterprise which the mineral wealth and capabilities of the country open up to the capitalist. Independently of the general belief in the boundless mineral resources of the soil of this country, and, in an especial degree, that of the counties of Cork and Kerry, there are circumstance connected with the Southern and Western Mining Company which inspire a confidence amounting to a certainty, and render the acquisition of shares in it a most desirable object. By the purchase of the Gurtavallig Mine, or by the junction of the proprietary of that mine with the Southern and Western Company, many excellent results are immediately obtained. In the first place, even before a single call has been made on the Company, they have a tangible field of enterprise prepared for their most spirited operations; inasmuch as the works on the mine are in an advanced state of progress, and are at this moment yielding a produce, without a formal operation, more than equal to the sum expended in clearing away the cliff, running the adit, and making the floor for the future dressing and preparing of the ore. In the second place, the company become the owners of the royalties of an estate extending eight miles by four miles, and abounding with the most certain indications of the richest metalliferous deposits. Here, then, without going beyond the boundaries of this estate, is an exhaustless field open to the best energies of the company, with an immediate power of ascertaining the character of the ore deposited by the hand of Nature within its rocky womb, and the amount of its productiveness. We may here, however, state that it is not the intention of the company to confine the scene of their operations to the mines of Gurtavallig, or to the limits of the estate of which they possess the right of royalties; but, as they succeed in one operation, to spread the blessings of employment, together with habits of useful industry, over the south and west of Ireland, so as to realize the fitness of the title which they assume.

There is not a mine in all Ireland so well circumstanced for immediately profitable operations as the Gurtavallig mine. Running an adit into the side of a cliff, rising hundreds of feet above the sea, the miners, while opening an entrance into the teeming soil, are at the same time obtaining the best possible means of drainage—one of the greatest difficulties in the mining operations of English companies; and sometimes so great, as to necessitate a vast outlay, besides occasioning a considerable loss of time. Here, there is no necessity for a powerful steam-engine, raised and worked at great expense; the happy conformation of the soil does away with that very common item in the working of mines.

We are happy to state, on the opinions of gentlemen most competent to form a right opinion—indeed to speak with the utmost certainty on all matters connected with mining operations—that the Gurtavallig Mine presents one of the richest lodes yet opened in Ireland. Even from the face of the cliff, which it was found necessary to cut away in

order to secure against the danger of future working, there has been obtained sufficient copper ore to double the amount expended in the operations already carried on. It is estimated that the average produce of the ore will be 18 p. ct., and that without any great difficulty of bringing in to the surface. There is no doubt that some rich portions of the lode may yield as much as 40, or even 50, per cent. of pure copper; but taking the average at 18 per cent. which is the estimate already formed, it offers the prospect of the most splendid remuneration to the shareholders. An idea may be better formed of how 16 or 18 per cent. would pay, when we state that 8 per cent. is considered good produce. The calculation then is, that in less than 12 months the works will be so far advanced, that large shipments of ore will be made—nay, so certain is an immediate return by the sale of ore, that it is thought there will not be a call of more than one-fifth of the whole capital, or 3*l*. on each share of 15*l*.

Here we cannot help remarking on the difference between mines and railroads, as a matter of speculation. We rarely hear of a line of railroad completed for the sum specified; and we believe it has scarcely ever occurred that the shareholders had not been obliged to pay up the whole amount of their shares—oftentimes before ever a train traversed the line, or the steam was got up in a single boiler. Then, in too many cases, the traffic is by no means equal to the sanguine statements of the writer of the prospectus, or the first hopes of the ardent shareholders. But, even where successful, the interest on the paid-up capital is limited to a certain per centage. We are not speaking of railways in any other sense than as a means of investing capital, and as a matter of speculation on the part of capitalists; and in this restricted sense, we alone deal with the question. Now, comparing them to mines—that is, where the character of the soil leaves no doubt of its hidden wealth upon the mind of a competent judge—the preference may be fairly accorded to the latter. In the first place, the amount of capital required for mining operations is not by any means so great as that required for the formation of a line of railway. Secondly, the return, which in railway speculation is long deferred, is rarely deferred for a longer period than two years in mines, unless under peculiar circumstances. And, thirdly, the rate of interest is only limited by the nature of the ore, and the resources of the mine—the former of which is frequently of the richest quality, while the latter is as frequently inexhaustible. Then, again, while the expense of a bill is oftentimes one of the most serious items in the first formation of a railway, the obtaining of Letters Patent is a matter scarcely worth speaking of. The fact is, that a mine could be worked into productiveness for what it would cost any ordinary railway Irish company to carry their bill through the shoals and quicksands of Parliament—not at all to allude to the total shipwreck occasioned by failure, or the more modified disaster of a powerful opposition. It will be borne in mind that we are taking the question solely upon Irish grounds; for we are aware there is a very great difference between the nature of metalliferous deposits in England and in Ireland. In the former, should the miner perceive those indications which in the latter country are so apparent to the most casual observer, he would embark his capital in the enterprise, and be well content to wait for six or seven years to repay himself with profit. In Ireland, the broken and diversified nature of the land affords the greatest facility to the miner, precluding the necessity of sinking those enormous shafts which swallow up so much capital in their formation. As one of the most striking instances of this facility, we may adduce the Gurtavallig Mine, which is so happily circumstanced, that more has been effected there in two months, than in other places could be effected in the same number of years.

We are happy to state, that the Southern and Western Mining Company of Ireland is essentially an Irish company, and chiefly in the hands of an Irish proprietary. It is not so entirely; but more than two thirds of the 10,000 shares are held by Irishmen, principally residents of Cork city and county, a less number belonging to other districts of the country; many of these latter living in Dublin. The company will be managed by some of the best business men of this city; by men in whose honour, integrity, and energy, the shareholders must have the most unlimited confidence.

The provisional directors have made a call for the first, and, in all probability, the only deposit, which is to be paid up by instalments of a pound each—one to be paid on or before the 2d of March; the other, on or before the 1st day of September following. We understand that a part of the first instalment has been already paid up; and in many cases parties have paid up both. We have now stated all that is of importance that the public should know in reference to the prospects and operations of the Southern and Western Mining Company of Ireland; and we shall only add that they shall at all times have whatever assistance we can render them, as a public journalist; for we are fully aware that in assisting to advance the interests of this company, we assist in advancing the welfare of our native land, and the independence of our industrious but unemployed population. Among the many services which mining operations must confer on this country, the necessary elevation of the labouring population is not the least beneficial. Raising the wages of the labourer, they raise the value of labour. While the country gentleman is willing to receive the labour of the poor men at 4d. and 5d. a day—oftentimes without diet—the Mining Company does not pay the labourer less than a shilling a day—frequently more. To extend a beneficial employment amongst the poor, we must extend mining and other operations; and, therefore, we hail with the utmost pleasure every new field of enterprise which opens a promise of benefit to the long-suffering poor of Ireland.—*Cork Southern Reporter.*

THE MINING INTEREST.—An acknowledgment of the memorial to Sir Robert Peel, praying for the abolition of the duty on foreign tin, copper, and copper ores, has been received by Mr. W. R. Lloyd. Mr. L. has also received a communication from Mr. Newdegate, wherein that gentleman expresses his willingness to support the petition for the reduction of the duty on copper ores; at the same time he expresses his fear, that this progress towards total abolition of protection to home manufactures may be more injurious to his Birmingham constituents than they appear to anticipate. It is stated that the present very high price of Cornish tin justifies the requirement of this relaxation of the duty on foreign production. This time last year the price was quoted at 65*l*. and 70*l*., while the present rate is over 100*l*. per ton, much to the prejudice of our competition with foreign manufactures.—*Midland Counties Herald.*

BUXTON, MACCLESFIELD, CONGLETON, AND CREWE RAILWAY.—This company have determined only to apply for a line from Congleton to Crewe in the present session.

PROFESSOR KANE.—At a meeting of the Royal Dublin Society, on Monday, the Lord Lieutenant conferred the dignity of Knighthood upon Professor Kane, who is now Sir Robert Kane.

LATEST CURRENT PRICES OF METALS.

LONDON, FEBRUARY 20, 1845.

	£	s.	£	s.	d.
IRON—Bars...Wales...*ton*	0	0—	9	0	0
„ ...London ...	0	0—	10	0	0
Nail rods „	0	0—	10	15	0
Hoop(Staf.) „	0	0—	12	0	0
Sheet „ „	0	10—	13	0	0
Bars „ „	0	0—	11	0	0
Welsh cold-blast foundry pig ..	5	0—	5	15	0
Scotch pig *b*, Clyde	3	18	6	4	0
Rails	0	0—	11	15	0
Russian, CCND *c*...	0	0—	15	0	0
„ PSI ...	0	0—	16	0	0
„ Gourieff	0	0—	14	10	0
„ Archangel	0	0—	13	12	6
Swedish *d*, on the spot	0	0—	11	15	0
„ Steel, fagt.	0	0—	16	5	0
„ „ kegs	15	5—	15	10	0
COPPER—Tile *f*	0	0—	92	0	0
Tough cake	0	0—	93	0	0
Best selected	0	0—	96	0	0
COPPER—Ordin. sheets, *lb.*	0	0—	0	0	10½
„ bottoms .	0	0—	0	0	11½
TIN—Com. blocks *g*...*cwt.*	0	0—	5	0	0
„ bars	0	0—	5	1	6
Refined	0	0—	5	3	0
Straits *h*	0	0—	4	8	0
Banca	0	0—	4	10	0
TIN PLATES—Ch., IC *i*, *box*	1	13—	1	14	0
„ IX ...	1	19—	2	0	0
Coke, IC	0	0—	1	8	0
„ IX	0	0—	1	14	0
LEAD—Sheet *k* .....*ton*	0	0—	20	10	0
Pig, refined	0	0—	21	10	0
„ common	0	0—	19	10	0
„ Spanish, in bd.	17	15—	18	0	0
„ American ...	0	0—	17	15	0
SPELTER—(Cake) *l*	0	0—	19	15	0
ZINC—(Sheet) *m* export.*	0	0—	30	0	0
QUICKSILVER *n* .....*lb.*	0	0—	0	4	6
REFINED METAL ....*ton*	0	0—	—		

a Discount 2½ per cent. *b* Net cash. *c* Discount 2½ per cent. *d* Ditto.
e In kegs ½ and ¼-inch. *f* Discount 3 per cent. *g* Ditto 2½ per cent. *h* Net cash.
i Discount 3 per cent. *k* Ditto 2½ per cent. *l* Net cash.
m Discount 1½ per cent. *n* Discount 1½ per cent. * For home use it is 22*l*. per ton.

(From our Correspondent.)

IRON (Welsh and Staffordshire) maintain last week's quotations, but the demand is dull. Scotch pig is not quite so firm—a sale of 1500 tons having been made in Glasgow, on the 18th inst., at 75*s*., *cash down*; and other sales, with a short time for payment, at 78*s*. 6d. to 80*s*. In foreign no transactions.

In COPPER, TIN, OR TIN PLATES, we have no variation to notice, and there is very little doing in either since the publication of last *Mining Journal*.

LEAD is very firm at quotations, with a very fair demand.

SPELTER—about 300 tons sold since the 13th inst., at 19*l*. 15*s*., and a sale is reported to-day of 150 tons, at 19*l*. 10*s*., but of this doubts are entertained.

Communicated by Messrs. Whitcomb and Barton, Old Broad-street.

The demand for English iron has been very languid since last week's *Mining Journal*; prices, however, are firmly maintained. Scotch pig-iron is not so good in consequence of the great pressure for money—several parcels having been sold for immediate payment, at reduced prices. In foreign iron and steel nothing doing.—English copper is in steady demand for the home trade, but for exportation, there are very few inquiries.—English lead fully maintains last week's quotations, and continues in fair request.—Tin plates very dull of sale, lower prices have been submitted to.—Spelter sales are reported 19*l*. 10*s*.

GLASGOW PIG-IRON TRADE.

FEB. 13.—No improvement can be quoted in this article, prices remaining about 78*s*. cash. The market is not at the present pressed with sellers, and makers firm at 82*s*. to 85*s*. —*National Advertiser.*

SEPT. 17.—We have passed a very dull week, closing with no improvement. Several of the makers have appeared as sellers, and sold to some extent at 62*s*. 6d., giving the purchaser time to take delivery. One maker also made a contract at 80*s*. nett, for a parcel. Such transactions as the above may tend to reduce prices of the stock held by speculators. Sales have been made this week at 78*s*., 76*s*., and 77*s*., and we quote 76*s*. the price, but is no demand at that figure.—*Glasgow Natioual.*

PRICE OF TIN PLATES AT NEWPORT.

No. IC., per box	£1	13	0	..... *Wasters*..	£0	2	0
No. IX., per box	1	19	0	..... „	0	3	0
No. IXX., per box	2	5	0	..... „	0	3	0

COAL MARKET, LONDON.

MONDAY.—Price of coals per ton at the close of the market:—Chester Main 15—Davison's West Hartley 16—Hastings' Hartley 16—Holywell Main 16—New Tanfield 14 3—Oakwellgate Main 14—Old Pontop 13—Ord's Redheugh 13—Taylor's West Hartley 15—Tanfield Moor 16 3—West Hartley 16—Wylam 15 3—Wall's End Clennell 14 6—Gosforth 15 3—Heaton 15 6—Hedley 15—Killingworth 15—Newmarch 14 3—Eden Main 14 6—Belmont 15 6—Braddyll's Hetton 17 3—Haswell 17 6—Lambton 16 6—Shotton 16 6—Stewart's 17 6—Adelaide 16 3—Low Beechburn 13—Tees 16 9—Sidney's Hartley 15 9.—Ships arrived, 135.

WEDNESDAY.—Buddle's West Hartley 15 6—Chester Main 14 9—Hastings' Hartley 16—Holywell Main 16—Old Pontop 12 6—Ord's Redheugh 13 6—West Hartley 16—West Wylam 15 6—Wylam 15—Wall's End: Bewicke and Co. 15—Braddyll's Hetton 16 6—Hetton 16 6 to 16 9—Stewart's 16 6—Adelaide 16—Adelaide Tees 16—Cannel 40—West Hartley Retherton 16—Ships arrived, 226; 66 sold, 160 unsold.

FRIDAY.—Adair's Main 13 6—Burnhope Fenham Hartley 14 6—Buddle's West Hartley 15 3—Chester Main 14 9—Hastings' Hartley 16 6—Original Tanfield 13—Old Pontop 13 6—Pontop Windsor 13—Taylor's West Hartley 15—West Wylam 14 6—Wylam 14 6—Wall's End Heaton 15—Hedley 14 6—Eden Main 14 9—Braddyll's Hetton 16 6—Haswell 15—Lambley 15—Pemberton 15—Russell's Hetton 16 3—Stewart's 16 6—Kelloe 16 3—Adelaide 15 6—Barrett 15—Cannel 30.—Ships at market, 161; sold, 65; unsold, 119.

Current Prices of Stocks, Shares, & Metals.

STOCK EXCHANGE, Saturday morning, Twelve o'clock.

Bank Stock, 7 per Cent., 209 10	Dutch, 2½ per Cent., 59¼
3 per Cent. Reduced Ann., 96⅛	Brazilian, 5 per Cents., New, 82½
3 per Cent. Consols Ann., 96¼	Cuba Bonds, 6 per Cent., —
3½ per Cent. Ann., 98⅛	Chilian, 6 per Cents., —
Long Annuities, 10 4	Colombian, 6 per Cents., 18½
India Stock, 10½ per Cent., 259 60	Mexican, 5 per Cents., 31
3 per Cent. Consols for Acc., 96⅛ ⅜	Spanish, 5 per Cents., 27½ ⅝
Exchequer Bills, 1000*l*., 38 6 pm.	Portuguese, 4 per Cents., 59
Belgian Bonds, 4½ per Cents., 98	Russian, 5 per Cents., 112

MINES.—In the British mine share market the steadiness, which has marked its proceedings for some months, continues; and while this species of property is sought after as a legitimate means of investment, there is none of that undue and unhealthy excitement which, for a season, marked the career of railroad infatuation. Shares in paying mines readily find buyers, and but little change in the general aspect of affairs has taken place since our last. A reference to our quotations will show that but few changes have taken place.

RAILWAYS.—There has been a general stagnation in the City during the week, not only in the money market, but in railway and scrip speculations. The report of the Parliamentary commission, as affects the narrow and broad gauge, has caused a heavy decline in Great Westerns, the shares being quoted above 10*l*. lower per share. The other registered shares have not, however, been much influenced by the opinions of the learned commissioners, and have maintained their prices. Although the market has been flat generally, both for scrips and dividend paying shares, still the well-established lines have not been attended with any material alteration. The pressure for money has been rather great in the City, and, unfortunately, it falls, in a great measure, upon those who are the least able to bear up against it—the second class of credits. Bills, as good as any that could be presented, which would have been taken in ordinary times in preference to all others, have either been refused discount, or have had unreasonably hard terms imposed upon them. This is a state of oppression in monetary affairs which cannot long exist, without the greatest injury, and the first hint of a remedy is naturally to be looked for from those who most suffer by it. Railway speculation has, there can be no doubt, gone rather too far, as, during the mania, numbers who took scrip which they now hold, are scarcely able to pay up, unless by submitting to a most exorbitant interest for the loans they may wish to make. The leading men in the City are looking forward with some anxiety to the result of the debate on Sir R. Peel's new liberal measures, as that will greatly influence not only the money but the share market—the members of which are most anxious to ascertain what will be the determination this session, as regards the appropriation of railway deposits, at present quite undecided, which causes the stagnation now existing, not only here, but the great speculating cities of the United Kingdom.

RAILWAY MEETINGS.—The proprietors of the London and Blackwall Company held their half-yearly meeting on Tuesday last, when it was made special, for the purpose of considering the carrying into effect arrangements for the sale and transfer of the London and Blackwall Extension to the London and Blackwall Company, which resolution was carried; and a dividend of 2s. 6d. per share, free of income tax, was declared.—The half-yearly meeting of the proprietors of the Great Grimsby and Sheffield Railway, was held at Sheffield, on Monday last,—Mr. Michael Ellison in the chair. He stated that the directors had abandoned the proposed branch to Horncastle, and also the scheme for a pier or landing place at Hull. At the time of the failure of the Sheffield Bank, they had a sum in it of 80,000*l*., but, by a transfer of a debt of the Sheffield and Manchester Company to them, and the transfer of the debt of the Lincolnshire Company, the balance was reduced to 30,000*l*.; but he was glad to state that when the bank had wound up their affairs, the company would not lose a farthing. At a special meeting subsequently held, resolutions were passed, approving of the proposed amalgamation with the Grimsby Dock, the Sheffield and Manchester, and Huddersfield and Manchester lines.—The adjourned half-yearly meeting of the proprietors of the Chester and Birkenhead was also held on Monday, at Liverpool, when the following dividends were ordered to be paid on the 23d inst., on the old 50*l*. shares, 14*s*.; new ditto, 12*s*. 6d.; on the 25*l*. shares, 7*s*.; and on the 20*l*. shares, 8d.—leaving a balance of 418*l*. 5*s*. 5d. in favour of the company.—The first half-yearly meeting of the shareholders of the Whitehaven and Furness Railway Company was held at Guildhall Chambers, on Wednesday,—the Earl of Lonsdale in the chair. The report stated that the capital required was 450,000*l*., and that nearly the whole of the line was now staked out. The receipts to the 29th September, 1845, had been 44,966*l*.; expenditure, 3008*l*.—leaving a balance of 41,958*l*. —The half-yearly meeting of the proprietors of the Pontop and South Shields Railway, was held on Thursday, at their office, Guildhall Chambers. The report showed a net profit of 10,986*l*. 16s. 2d. for the half-year ending the 31st of Dec. last, from which, deducting 4439*l*. 7s. 4d. interest upon the debt of the company, left a balance of 6623*l*. 9s. 7d.; a dividend of 1*l*. 11s. 6d. per share was declared.—The first half-yearly meeting of the proprietors of the Madras Railway Company, was held at their office, on Thursday. From the report it appeared, that deposits had been paid upon 16,885 shares; that 1050 had been since allotted, and 5000 shares reserved for Madras—thus leaving 2065*l*. at the disposal of the company. The distance of the line stated is to be 65 miles. The account of receipts and expenditure showed a balance of 1440*l*. 10s.—A meeting of the proprietors of the Madrid and Valencia Company, was also held on Thursday. From the report presented it appeared that, of the 80,000 shares appropriated to this country, 53,000 had been taken, and the deposit of 2*l*. per share paid thereon; 40,000 had been appropriated to Spain, and were in course of allotment. The amount received on deposits (106,000*l*.), had been, with the exception of 4194*l*.—being the amount of expenses invested at interest, with the exception of 30,700*l*., deposited as caution money in the Bank of England. The cost of the line was estimated at about 2,100,000*l*., on which it was calculated an interest of 22 per cent. would be derived.—A meeting of the shareholders of the Shropshire Mineral Railway, was held yesterday, at the George and Vulture, when a pretty exposure was made. Mr. Serjt. Adams, who took the chair, said that it was the only railway in which he had taken shares, and had joined the direction from the respectability of the parties and the solicitor to the company; it had been all along held out that the line would pay from 10 to 15 per cent. He had only attended four meetings of directors, and, at the last, on the 12th of Dec., he asked to see the banker's book, when he found there was only 6000*l*. in hand, instead of 30,000*l*.; absolutely astonished, he required to see the checks for 21,000*l*. of this deficiency, when they were brought and laid on the table; but, during the few minutes in which he was being informed that this sum had been laid out by the committee of finance in the purchase of shares for the benefit of the company, the cheques had again disappeared—here there was much uproar, until a Mr. Griffiths (a director), said he was the person who took them, and would explain. After much confusion, during which the offending parties who had signed the cheques, offered to make restitution; and, on the motion of Mr. Ald. Copeland, a committee of five was appointed to investigate the affairs of the company from the beginning, and report at a future meeting.

RAILWAY TRAFFIC.—We are glad to see that, notwithstanding the late panic, and the unsettled state of the market, the amount of traffic for the last week, on nearly 1800 miles, was 117,898*l*.—viz., 57,805*l*. for passengers only, 29,910*l*. for the carriage of goods, and a remainder of 30,183*l*. for passengers and goods together—being an increase over the corresponding week last year of 2967*l*.

MESSRS. LAMOND'S SALES.—TUESDAY.—Boston, Stamford, and Birmingham, (1*l*. 2s. 6d. pd.), 13*s*. 6d.; Northampton, Banbury, and Cheltenham, (2*l*.), 1*l*. 17*s*. 6d.; Scottish Midland Extension, (2*l*. 10*s*.), 2*l*. 5*s*.; Ambergate, Nottingham, and Boston, (2*l*. 12*s*. 6d.) 2*l*. 11*s*.; Cameron's Coal and Loughor Railway, (2*l*.), 2*l*. 1*s*.; Buckinghamshire, (2*l*. 2*s*.) 2*l*. 2*s*.; South Staffordshire, (2*l*. 10*s*.), 2*l*. 10*s*.; Irish Great Western, (4*l*.), 4*l*. 7*s*.; Direct London and Portsmouth, (3*l*. 15*s*.), 4*l*. 1*s*.; Vale of Neath, (2*l*.), 2*l*. 12*s*.; North Staffordshire, Churnet, and Potteries, (2*l*. 2*s*.), 5*l*. 17*s*.; Shrewsbury and Birmingham, (2*l*. 10*s*.), 3*l*. 5*s*.; Calcutta and St. George's Point, (7*s*.), 9*s*. 6d.; Goole and Doncaster, (2*l*. 2*s*.), 3*l*. 8*s*.; Blackwall Extension, (3*l*.), 3*l*. 2*s*.; Chester and Manchester, (2*l*. 2*s*.), 2*l*. 12*s*. 6d.

FRIDAY.—Buckinghamshire, (2*l*. 2*s*.), 2*l*. 4*s*. 6d.; Newry, Warren Point, and Rostrevor, (2*l*.), 3*l*.; Shrewsbury and Birmingham, (2*l*. 10*s*.), 3*l*. 4*s*. 6d.; Bordeaux, Toulouse, and Cette (Mackenzie), (2*l*.), 2*l*. 2*s*.; North Staffordshire, Churnet, and Potteries, (2*l*. 2*s*.), 6*l*.; Aberdeen, (10*l*.), 10*l*.; Goole and Doncaster, (2*l*. 2*s*.), 3*l*. 5*s*.; South Eastern and Dover—No. 4, (2*l*. 10*s*.), 3*l*. 9*s*.; Wolverhampton, Shrewsbury, and South Staffordshire, (2*l*. 10*s*.), 2*l*. 10*s*.; South Midland, (2*l*. 2*s*.), 4*l*. 7*s*. 6d.; Dublin and Enniskillen, (5*l*.), 5*l*.; Ambergate, Nottingham, and Boston, (2*l*. 12*s*. 6d.), 2*l*. 8*s*. 6d.; Larne, Belfast, and Ballamena, (2*l*. 2*s*.), 1*l*. 10*s*. 6d.; Shropshire Union and Canal, (2*l*. 2*s*.), 2*l*.; London and Manchester—Remington, (2*l*. 15*s*.), 1*l*. 12*s*. 6d.; Leeds and Carlisle, (2*l*. 12*s*. 6d.), 2*l*. 2*s*.; Blaenavon Iron Company, (50*l*.), 55*l*.

LEEDS, THURSDAY.—Our markets are without any material change, prices continuing low, and business very heavy; until the deposits now lodged with the Bank of England are put into circulation again, it would be unreasonable to expect any improvement in the appearance of affairs. The West-Riding Union Company have failed to comply with standing orders, but the errors found are of so trivial a character that it is expected the select committee will allow them to proceed with their bill; the market fell on Saturday to 5*l*., but to-day closes buyers at 5¼*l*. Bradfords have been done at 53*l*., and other local stocks are quiet; Thirsks have been done as low as 10*l*.

R. B. WATSON, TOOTAT, & BARFF.

HULL, THURSDAY.—Our market has been flat throughout the week. People have been so long doing nothing, that it has become difficult to induce them to resume operations, even in cases where profit is clear and evident.

THAMES TUNNEL COMPANY.

The number of passengers who passed through the Tunnel in the week ending Feb. 14, was 21,332; amount of money, £88 17*s*. 8d.—(Last year, 100*l*. 10*s*. 7d.)

CURE OF A DISEASED ANKLE OF LONG STANDING BY HOLLOWAY'S OINTMENT AND PILLS.—The wife of Mr. Batchelor, a carpenter, residing for 30 years past at Hampstead, had been laid up for a considerable time with a diseased ankle; the pain was often almost maddening. By bad treatment, humours settled in her head and other parts, causing incessant and distracting headaches, which had such an effect upon her health that there was every symptom of her constitution rapidly breaking up. She had recourse to numerous medical men, without obtaining the least benefit, but, notwithstanding, Holloway's Ointment and Pills cured her, and made her as well as she ever was in her life.—To be purchased of all who sell medicines, and at Professor Holloway's Establishment, 244, Strand London.

RAILWAY SHARE LIST.

RAILWAYS.	*Paid*	*Closing pr. last week.*	*Closing pr. last night.*
Aberdeen	£5	10½	10⅝
Amber, Nottingham, Boston, and Erewash Junction	2½	—	2⅝
Birmingham and Gloucester—100*l* shares	100	129	126
Birmingham and Oxford Junction—30*l* shares	2	2¼	2⅛
Bristol and Exeter—100*l* shares	70	99	97
Bristol and Gloucester—50*l* per share	30	56½	—
Caledonian—50*l* per share	5	14¼	13⅞
Cambridge and Lincoln—25*l* shares	1½	—	—
Chelmsford and Bury	1½	2¼	2
Chester and Holyhead—50*l* shares	15	22½	21½
Cork and Killarney—50*l* shares	2½	—	—
Cork and Waterford—25*l*. shares	1½	1½	1½
Cornwall—50*l* shares	5	4½	—
Derby, Uttoxeter, and Stafford	2½	1¼	—
Direct Northern—50*l* shares	2½	2½	2½
Direct Manchester (Remington's)—20*l* shares	2½	1½	1⅝
Ditto Bastrick's	5½	4	—
Dublin and Belfast Junction—50*l* shares	10	6¼	6¼
Dublin, Belfast, and Coleraine—50*l* shares	2½	—	—
Dublin and Galway—50*l* shares	4	4¾	4¼
Dundalk and Enniskillen—50*l* shares	2½	—	—
Eastern Counties—25*l* shares	14*l* 16*s*	22½	22
East Lincolnshire	1½	2½	2½
Edinburgh and Glasgow—50*l* shares	50	79½	78½
Edinburgh and Perth	3	3⅝	—
Exeter, Yeovil, and Dorchester—30*l* shares	2½	2½	—
Goole and Doncaster—20*l* shares	42*s*	1⅝	3⅜
Grand Junction—100*l* shares	100	—	—
Grand Union (Nottingham and Lynn)	1⅜	1¼	1½
Great Grimsby and Sheffield—50*l*. shares	5	—	—
Great Southern and Western (Ireland)—50*l*. shares	15	21½	—
Great North of England—100*l* shares	100	218	220
Great Western—100*l* shares	80	153	154
Guildford, Farnham, and Portsmouth—50*l*. shares	5	5⅛	4⅞
Hull and Selby—50*l* shares	50	108	107½
Lancaster and Carlisle—50*l* shares	25	57	57
Leeds and Carlisle	2½	—	1½
Leicester and Birmingham—20*l* shares	22*s*	½ dis.	—
Leicester and Bedford—20*l* shares	22*s*	½ dis.	½ dis.
Leicester and Tamworth—20*l* shares	42*s*	½ dis.	—
Liverpool and Leeds Direct—50*l* shares	2½	1⅝	—
Liverpool, Manchester, and Newcastle Junction	1½	3	3½
London and Birmingham	stock.	228	222
London and Birmingham Extension—25*l* shares	1½	—	—
London and Blackwall	Av. 16*l* 13*s* 4*d*	9½	8⅝
London and Brighton—50*l* shares	50	67½	65½
London and Croydon	Av. 13*l* 15*s* 9*d*	22½	22
London and Greenwich	Av. 12*l* 15*s* 4*d*	—	9⅝
London and South Western	Av. 41*l* 6*s* 10*d*	80	78½
London and York—50*l* shares	2½	4½	3½
London, Warwick, and Kidderminster—50*l* shares	2½	1⅝	1½
London, Salisbury, and Yeovil—50*l* shares	2½	—	—
Londonderry and Coleraine—50*l* shares	2½	5⅝	5
Londonderry and Enniskillen—50*l* shares	5	3	2½
Lynn and Ely—25*l*. shares	5	6½	6⅝
Lynn and Dereham—25*l* shares	5	—	5
Manchester and Leeds—100*l* shares	82	136	133½
Manchester and Birmingham—40*l* shares	40	78½	78
Manchester, Buxton, and Matlock—20*l* shares	42*s*	1⅞	⅞ pm.
Manchester and Southampton	2	2½	2½
Midland	Stock	153	150½
Ditto Birmingham and Derby	Stock	122	120
Midland Great Western (Irish)—50*l* shares	2½	—	9
Newcastle and Berwick—25*l* shares	10	22½	21
Newcastle and Carlisle—100*l* shares	100	—	—
Newcastle and Darlington Junction—25*l* shares	25	46	43½
Ditto New (Brandling)—25*l* shares	20	40	38
Newport and Abergavenny	2½	—	—
Newry and Enniskillen—50*l*. shares	2½	—	½
Newark, Sheffield, and Boston—25*l* shares	2½	2⅝	2½
North British—25*l* shares	17½	25½	27½
North Devon	2	1½	—
Northern and Eastern—50*l* shares	45	—	69½
North Kent and Direct Dover—50*l* shares	2½	3½	2⅝
North Staffordshire—20*l* shares	42*s*	3⅝	3½ pm.
North Wales—25*l* shares	3½	3¼	—
Norwich and Brandon—20*l* shares	18	26	25½
Northampton, Banbury, and Cheltenham	2	1⅞	1¼
Oxford, Worcester, and Wolverhampton	12½	16	14
Perth and Inverness	2½	—	2½
Portsmouth Direct—50*l* shares	3½	4½	3½
Preston and Wyre—50*l* shares	50	35	35
Richmond—20*l* shares	5	17	16½
Rugby and Huntingdon—20*l* shares	2	1⅝	1¼
Scottish Central—25*l* shares	7½	16	16
Scottish Midland—25*l* shares	5	—	6
Sheffield and Manchester—100*l* shares	100	—	—
Shrewsbury and Birmingham	2½	3½	3½
Somersetshire Midland	2½	1½	1½
South Devon—50*l* shares	25	37	—
South Eastern and Dover	Av. 33*l* 2*s* 4*d*	39½	38½
South Midland—20*l* shares	42*s*	2½	2¼ pm.
South Wales—50*l* shares	2½	6½	6½
Staines and Richmond—20*l* shares	1	2½	2½
Trent Valley—20*l* shares	5	23½	26
Trent Valley and Holyhead Junction—20*l* shares	2½	2	1⅝
Vale of Neath	2	—	3
Waterford and Kilkenny—20*l*. shares	3	2½	2½
Welsh Midland	2½	2	1⅝
Wilts, Somerset, and Weymouth—50*l* shares	2½	3⅝	3½
Yarmouth and Norwich—20*l*. shares	20	27½	27½
York and Carlisle	2½	2	2
York and North Midland—50*l* shares	50	100	101
Ditto Selby—50*l* shares	30	75	73

FOREIGN RAILWAYS.

Boulogne and Amiens—20*l* shares	10	12	12
Bordeaux and Toulouse and Cette (Mackenzie)—20*l* shares	2	2½	2½
Bordeaux, Toulouse, and Cette (Espaleta)—20*l*. shares	2	2½	2½
Central of Spain—20*l* shares	2	1	1½
Dutch Rhenish—20*l* shares	5	7½	7
East Indian	¼	1⅛	1⅛
Great Northern of France (constituted)	5	15½	15¾
Great Western Bengal	¼	—	¼
Great Western Canada—22½*l*. shares	2½	—	2⅜
Jamaica and South Midland Junction—20*l* shares	1	3½	3½
Jamaica North Midland	1	¾	—
Louvaine and Jemappe—20*l* shares	4	2	2
Lyons and Avignon—20*l* shares	2	2½	2½
Luxembourg	4	2½	2⅝
Namur and Liege—20*l* shares	4	3½	3⅝
Orleans and Vierzon—20*l* shares	10	—	18½
Orleans and Bordeaux—20*l* shares	6	11½	11⅝
Paris and St. Quentin—20*l* per share	2	—	—
Paris and Orleans—20*l* shares	20	49½	51½
Paris and Rouen—20*l* shares	20	39	40½
Rouen and Havre—20*l* shares	18	28½	30
Sambre and Meuse—20*l* shares	6	5½	5½
Strasburg and Basle—14*l* shares	14	—	—
West Flanders	4	—	4½

RAILWAY TRAFFIC RETURNS.

Name of Railway.	Lgth. Rway.	Present actual cost.	Last Div.	*Traffic Returns.* 1846	1845
Arbroath and Forfar	15	£140,782	2½ p.c.	£160 0 0	£156
Chester and Birkenhead	15	320,640	2½	449 16 4	350
Dublin and Drogheda	32	631,238	4	538 15 2	538
Dublin and Kingstown	6	349,736	9	671 9 11	619
Dundee and Arbroath	17	183,596	4	225 2 6	222
Durham and Sunderland	19	302,118	2	552 4 7	709
E. Counties & North. & East.	124½	4,600,328	5	6365 13 1	3280
Edinburgh and Glasgow	46	1,086,236	6	2582 2 7	2801
Glasgow, Paisley, and Ayr	51	1,104,773	6	1764 1 8	1387
Glasgow, Paisley, & Greenock	23	466,134	2	748

PRICES OF MINING SHARES.

Shares.	BRITISH MINES. Company.	Paid.	Price.
235	Andrew and Nangles	25½	55
100	Barristown	22	245
4000	Bedford	2½	5
320	Birch Tor Tin Mine	10½	12
8000	Blaenavon	50	40
100	Botallack	175	300
120	Brewer	—	35
10000	British Iron, New, regis.	10	24
—	Ditto ditto, scrip	10	24½
128	Budnick Consols	—	30
100	Bwich Cwmerfin	20	200
1000	Callington	19	24
256	Caradon Consols	45	80
256	Caradon Copper Mine	4½	6
256	Caradon Mines	4½	36
256	Caradon United	19	20
256	Caradon Wh. Hooper	9	9
1000	Carn Brea	15	100
114	Charlestown	—	240
256	Chypraze	—	55
1900	Combmartin	5½	8
128	Comfort	—	30
5000	Con. Tretoil Mining Ass.	3	1½
128	Condurrow	10	17½
2560	Cook's Kitchen	—	8
1000	Copper Bottom	1	5
3200	Cornubian Lead Co.	3	1½
240	Craddock Moor	8	65
128	Creeg Braws	120	80
128	Cosheen	20	200
1024	Devon & Courtney Con.	1	3
1000	Dhurode	2	5
144	Dolcoath	—	80
10080	Durham County Coal	45	9
128	East Pool	5	60
9000	East Tamar Consols	1	3½
—	East Wheal Albert	1	5
256	East Wheal Alfred	2	12½
94	East Wheal Crofty	—	450
128	East Wheal Rose	50	1500
123	East Wheal Seton	2½	16
512	Foway Consols	—	80
20000	Galvanised Iron Co.	10	10
1000	Godolphin	—	35
256	Gonamena	18	120
128	Gover	23	200
2444	Grambler & St. Aubyn	—	40
100	Great Consols	1000	400
256	Great Calestick Moors	—	11
2560	Great Mitchel Consols	—	2
100	Grogwinion	5	20
1600	Gunnis Lake	1½	3
128	Hallenbeagle	—	50
1000	Hanson	5	1
1000	Harrow barrow Old Mine	2½	2¾
800	Hawkmoor	3	6
6000	Heignston Down Con.	1	2
256	Herodsfoot	9	12
10000	Hibernian	12½	1
1000	Holmbush	14	23
256	Ivy Tor	1½	5
1200	Kirkcudbrightshire	1½	1½
2048	Lamerhoee Wh. Maria	5½	6½
128	Lanarth & Penstruthal	—	150
200	Larkholes	1	3
160	Levant	—	150
1000	Lewis	5	6
128	Ludcott	3	3
2800	Marke Valley	10	4½
20000	Mining Co. of Ireland	7	12¾
1000	Nant-A'r-Nelle	2	2
200	Nanterrow Consols	10½	12
128	North Fowey Consols	10	20
200	North Holmbush	—	15
100	North Pool	11	37
70	North Roskear	10½	600
256	North Treburget	2½	4
100	North United	41	45
128	North Wh. Providence	2½	10
256	North Wheal Rose	22½	35
15000	Northern Coal Co.	23	2
600	Old Delnbole Slate Co.	25	45
128	Par Consols	—	500
256	Penhallow Moor	15	5
100	Penrhiw	30	65
128	Pen-y-Cefn Mine	50	55
512	Plymouth Wh. Yeoland	1½	3½
10000	Rhymney Iron	50	33 4
256	Rose Consols	10	7
1000	Rosewall Hill	1	2½
1024	Roscarrock	2½	3
9500	Silver Valley	2	2
256	Sourton Consols	¼	5
128	South Caradon	5	450
260	South St. George	9½	15
800	South Towan	10	1½
256	South Trelawney	8½	14
128	South Yeoland	15½	28½
128	South Wheal Basset	—	220
124	South Wh. Francis	—	90
4034	South Wh. Maria	—	2
256	South Wheal Rose	2	3
256	St. Austell Consols	6	25

Shares.	BRITISH MINES—continued. Company.	Paid	Price
1000	Stray Park	43	21
9600	Tamar Consols	3	5
6000	Tincroft	7	15
256	Ting Tang	67	67
128	Tokenbury	119	84
1024	Trelawney Consols	1½	2
5000	Treleigh Consols	6	3½
256	Trenow Consols	—	170
96	Tresavean	10	300
120	Trethellan	5	60
120	Treviskey and Barrier	61	130
128	Trewavas	—	10
128	Trewellard	12	25½
4000	United Hills	5	4
100	United Mines	300	900
128	West Basset	10	20
256	West Caradon	20	375
128	West Cargoll	2	15
512	West Fowey Consols	40	35
—	West Kekewich Consols	—	3½
256	West Providence	—	7½
200	West Seton	—	40
120	West Trethellan	5	40
256	West Wh. Friendship	2	12½
3845	West Wheal Jewel	11	3½
2560	West Wh. Maria	½	3
2560	West Wh. Mitchell	—	2
256	West Wheal Shephard	—	—
256	West Wheal Tolgus	21½	21½
256	West Wheal Treasury	12	16
240	Westerlake	3	3
6000	Wicklow Copper	5	17
256	Wheal Albert	10	12
128	Wheal Acland	13	14
256	Wheal Blencowe	—	18
256	Wheal Boscastle	3½	9
128	Wheal Catherine	5½	5
256	Wh. Cleveland	2½	5
68	Wheal Clifford	—	450
1024	Wheal Concord	3½	5
256	Wheal Fortescue	1½	20
384	Wheal Franco	22	50
256	Wheal Gill	17½	16
1000	Wheal Harriet	1	2½
128	Wheal Henry	—	10½
109	Wheal Hope (Zennor)	23	25
256	Wheal Hope	7	1½
265	Wheal Kendall	11½	5
1024	Wheal Maria	1	550
4000	Wheal Martha Consols	3	3
1024	Wheal Mary	1	1½
256	Wh. Mary Ann	5	55
1024	Wh. Mary (Calstock)	2	3
256	Wheal Mary Consols	10	14
256	Wh. Mexico	3	6
256	Wheal Norris	9	12
128	Wheal Penrose	—	5
128	Wheal Pollard	9½	30
128	Wheal Prospect	4	9
128	Wheal Providence	4	—
128	Wheal Reeth	1	60
256	Wheal Robins	13	5
128	Wheal Rose	40	20
512	Wheal Sarah	2½	5
99	Wheal Seton	150	675
256	Wheal Sisters	25½	80
128	Wheal St. Cleer	21½	50
128	Wheal Trannack	19	25
130	Wheal Trelawny	15½	270
256	Wheal Trevenna	4	4
256	Wheal Trewennan	—	10
128	Wheal Venland	2½	5
256	Wheal Victoria	2	6
127	Wheal Virgin	—	20
1024	Wheal Walter	2	2½
256	Wheal Williams	4	21

Shares.	FOREIGN MINES. Company	Paid	Price
5000	Alten Mining Company	14½	1
15000	Asturian Mining Co.	5	3½
10000	Anglo-Mexican Co.	100	3
3374	Ditto Subscription	25	4
2000	Bolanos	150	4
12000	Ditto Scrip	15	4½
10000	Brazilian Imperial	21	4½
10000	Cata Branca (Braz. Co.)	6½	—
12000	Cobre Copper Co.	40	21
8500	Colombian Co. regis.	55	4½
5000	Ditto Scrip	—	
10000	Copiapo Mining Co.	14	1½
20000	General Mining Ass'n.	20	14
5051	Mexican Company	59	6
12000	Mocaubas & Cocaes	25	4½
29320	Rl.del Monte, regis.	28½	4
	Ditto unregistered		4
	Ditto Red Debentures	—	19
	Ditto Black ditto	—	17
	Ditto Loan Notes	150	117
7000	Royal Santiago	10	12
2000	Pachuca Mines	3	3½
11000	St. John del Rey	15	8
43174	United Mexican	28½	4½

**** *We should feel greatly obliged by agents, or others interested, furnishing us with such corrections for our Share List that we may not have received through our usual channels of information—our object being, to present as accurate a list of prices as can be obtained—to procure which, we solicit the aid of correspondents in general.*

WORK PERFORMED BY CORNISH ENGINES.

The number of pumping-engines reported for the month of Jan. is 53—the quantity of coals consumed being 2804 tons, lifting, in the aggregate, 27,000,000 tons of water 10 fathoms high—the average duty of the whole is, therefore, 53,000,000 lbs. lifted 1 foot high by the consumption of a bushel of coal. The following are those exceeding the average:

Mines.	Engines.	Length of stroke	Load in pounds.	Load per sq. inch on plst.	Strokes per min.	Consump. of coal in bus.	Million lbs. lifted 1 foot by consump. of 1 bush. coal	Average quantity of water per min.
Wh. Prosper	Western, 80-in.	9·7	67,435	13·9	5·3	3130	58·2	433·0
Godolphin	Sims's 80-inch	10·0	75,107	11·9	5·4	1988	74·3	1049·4
Ditto	Roberts's 80-in.	10·0	75,454	12·0	8·8	4281	55·6	
Great Work	Leeds 60 inch	9·0	47,020	14·5	9·2	2843	53·8	218·9
Wheal Vor	Borlase's 80-in.	10·0	117,900	18·7	7·1	5770	63·5	640·0
Carn Brea	Sims's 50, 99 in. combined	9·0	34,342	13·6	6·3	829	75·1	225·0
United Mines	Taylor's 85-in.	11·0	91,656	14·6	6·7	3050	87·7	
Ditto	Eldon's 30-inch	9·0	13,631	16·0	8·4	555	67·2	
Ditto	Loam's 85-inch	10·0	89,320	11·8	6·4	3054	60·9	1890·6
Ditto	Hocking's 85-in	10·0	98,368	14·6	7·3	4230	59·9	
United Hills	Williams's 80	10·0	73,895	11·7	7·0	2840	60·9	
East Wh. Rose	Penrose's 70 in.	10·0	41,945	9·8	3·2	874	58·7	737·9
Ditto	Michell's 70-in.	10·0	52,816	12·3	6·9	2196	56·7	

NATIONAL ASSOCIATION OF INVENTORS.—An association, for the encouragement and protection of inventors, is just being established at New York, on principles similar to those which have been frequently under consideration here, and which, if carried out, would prove such a desideratum in this country. At present, the association is only in *embryo*, and a statement of their views, and a stated code of laws, have been submitted in a circular to those interested in such an establishment, whether as inventors or as assignees of patent rights. Their objects they state to be, to exert such an influence upon public feeling as may lead to improvements in the patent laws, and render a reality what is a little more than a mockery.—Second, to encourage and promote a spirit of useful inquiry into those branches of knowledge which have contributed to the comfort of the human family.—Third, to promote harmony among inventors by appointing arbitrators to adjust the question in dispute, and thus prevent expensive litigation.—Fourth, to afford counsel and advice to persons engaged in search of useful discoveries, and to accumulate funds for the purpose of bringing new machines and improvements into operation.—Fifth, to keep an authentic record of the dates at which new discoveries are submitted to the secret committee, for the purpose of settling questions of priority, and securing reputation at least when a patent is not desired, or could not perhaps be sustained.—Sixth, to provide place of deposit for drawings and models.—Seventh, to collect a library of reference of such works as may serve to aid inventors in perfecting their discoveries, and prevent them from wasting their time and ingenuity in re-inventing what, from lapse of time, has become public property.—Eighth, to foster and extend the means of education practically to those who intend to devote themselves to the practise of the mechanical and useful arts. Many other useful objects would present themselves as the society became matured; and, it is to be hoped, that these in themselves, of so praiseworthy a character, will receive such encouragement as to enable them, at no distant period, to bring their plans into successful operation—while we need scarcely draw the attention of inventors and patentees in this country to the important and desirable results that must ensue from the establishment of an institution founded on arrangements similar to those of this association.

METALLIC PROGRESS IN SPAIN.—The *Journal de Liege* states, that upwards of 40 iron founders, metal casters, and miners, have left that city, for Spain, with a good five years' agreement. The greater part of these men are married, and several of them have taken their families with them. It is well known, that Spain has some very extensive iron mines, and of a very superior quality, similar to those of Sweden; but, in consequence of the unsettled state of the country, for the last 35 years, mining operations have been entirely neglected. Tranquility having happily been re-established, in a great measure, there is a general enterprising spirit arising throughout that rich mineral queendom, to work her hidden treasures. She not only possesses gold, silver, mercury (or *argentum vivum*), iron, copper, or lead mines; but extensive coal beds, which have hitherto been untouched or nearly unexplored. The Government is trying to improve the ports, and offering every encouragement to mining speculation, and there is very little doubt, when the introduction of railways is fully established (as there are many projects for lines from one end of the country to the other), that mining enterprise and industry will take a most extensive development, and render Spain what she ought to be among the nations of Europe.

CHEMISTRY AS APPLIED TO MINING PURSUITS.—The immediate connection between chemistry and mineralogy, and the vastly important bearing which it has upon all mining interests, has long been felt,—and it has alike long been seriously regretted, that there existed no really separate public establishment, where its general principles, and more particularly those of analysis, could be economically studied. It is with much pleasure we call attention to the Royal College of Chemistry, which is now likely to take a first-rate position among similar institutions,—and which, it is to be hoped, will remain a thoroughly public establishment, requiring no patronage, no crawling subserviency,—nothing but the payment of the required fees to admit parties to the full participation in its benefits. It augurs well that her Majesty has directed the term "Royal" to be adopted. Prince Albert has sent a donation of 100*l.*, and has become its president; and the Prince of Wales's council for the Duchy of Cornwall, has also presented 100*l.*—a circumstance in itself highly indicative of the interest known to exist between chemistry and mining. We know that, at the present day, much valuable mineral matter is wasted, from the ignorance which exists on the real nature of many of the products of our mines, and were chemical analysis more generally understood, much property would be saved—and we shall, doubtless, eventually see hosts of chemists employed in mines, abroad and at home, who will have obtained their knowledge of this interesting and highly beneficial science from the London Royal College of Chemistry.

CITY OF LONDON RAILWAY.—At a court of Common Council held on Thursday last, the railway business of the City was brought forward, and Mr. Hartley, the chairman of the Parliamentary Committee, brought up the report on the North Kent Railway (City extension) Bill, proposing to make a terminus in the City of London. The terminus is proposed to be near Union-street, in the Borough, with a large depot for goods, and the railway to be carried by a viaduct over Southwark Bridge, to a point in Thames-street, for passengers only. At this announcement, several of the members, who are in sad alarm, lest the railway ogre should eat up all their privileges, commenced a long tirade against railways, and their ruthless encroachments; and Sir P. Laurie feared that of the 500 acres in the City, railway companies would possess 200. Mr. Pewtress, Mr. Ashurst, and others, took a more enlightened view of the subject, and called the attention of the court to the fact, that this terminus would greatly improve the traffic and business of the City, and that the bill would go to Parliament whether they agreed or not; and, if they did not mind, they would be looked upon as obstructives, and, like the Tories, be completely swept away. After some long faces on the part of privilegists, the report was referred to the improvement committee to examine and report.

WEST INDIA MAIL.—The *Tay* arrived at Southampton yesterday evening: her dates are—St. Jago de Cuba, 18th Jan.; Demerara, 19th; Tobago, 20th; Trinidad, 20; Jamaica, 23d; Jacmel, 25th; Barbadoes, 25th; Granada, 26 th; St. Vincent, 26th; St. Lucia 26th; Martiniques, 27th; Dominique, 27th; Guadaloupe 27th; Porto Rico, 28th; Antigua 28th; Montserrat, 28th; Nevis, 28th; St. Kitts, 28th; Tortola, 29th; and St. Thomas, 31st. The *Tay* brings on freight 4842 ounces of gold dust; 112*l.* 18s. 9d. in British coins; 6lbs. 9½ ounces of silver; 31 tierces and 3 barrels of coffee; 302 bales of sarsaparilla; 915 lbs. of tortoiseshell; 50 packages of succades, &c.

The traffic on the Kingston and Spanish Town Railway was progressively increasing, and was exceeding the most sanguine anticipations of its promoters. The trains had been running two months, without the slightest accident or interruption. It is expected that its extension to the Angels, a distance of four miles beyond Spanish Town, would be completed by the 1st of May. The Act for extending railway communication to Clarendon Park (called the Jamaica South Midland Junction) had passed the Assembly, and the necessary engineering surveys had been commenced. When the line is completed, it will bring a very large portion of the island into communication with Kingston, and produce a proportionate effect upon the shipping and commerce of that city. Amongst the improvements in contemplation it is proposed to establish a gas company in the town of Kingston.

MINING PROPERTY.—CAPITALISTS who are disposed to INVEST in CORNISH and FOREIGN MINES, will find the present opportunity very favourable for so doing. From large sums having been lately diverted from such investments for railway speculations, standard mines are now selling at prices that will pay the purchaser 20 per cent. per annum for his outlay. There are also other mines that are on the eve of paying dividends, which can be recommended with confidence.
Applications to be made to Mr. JAMES HERRON, mining agent, No. 3, Adam's court, Broad-street, London. 37

MINING OFFICES, 16, CORNHILL—Mr. R. TREDINNICK (of Cornwall) having established PRACTICAL AGENTS and CORRESPONDENTS in every MINING DISTRICT, whereby he obtains early and accurate information respecting MINES, proffers his services to capitalists and adventurers in the PURCHASE and DISPOSAL of SHARES. Mr. Tredinnick has business to do in the following MINES:

North Roskear	North Pool
Wheal Seton	Andrew and Nangiles
West Seton	Wheal Bucketts
East Seton	South Trelawney
Trelawney	United Hills
Wheal Mary Ann	Grambler and St. Aubyn
East Wheal Crofty	Herodsfoot

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COPPER ORES.

Sampled Feb. 4, and Sold at Andrew's Hotel, Redruth, Feb. 19, 1846.

Mines.	*Tons.*	*Price.*	*Mines.*	*Tons.*	*Price.*
Wh. Maria	112	£3 0 6	West Caradon	94	£6 19 6
ditto	107	6 7 6	ditto	91	7 3 6
ditto	105	6 11 6	ditto	48	4 0 0
ditto	100	7 9 6	Par Consols	89	4 17 6
ditto	96	7 1 0	ditto	66	4 4 6
ditto	95	4 7 0	ditto	58	9 4 0
ditto	90	6 10 0	ditto	57	9 0 0
ditto	88	6 6 0	Mark Valley	80	3 7 0
ditto	81	6 17 0	ditto	68	3 6 0
ditto	78	4 13 6	Holmbush	118	7 11 6
ditto	74	3 12 0	Bedford United	103	5 4 6
ditto	70	5 10 0	Wh. Providence	45	4 19 0
ditto	52	4 8 0	ditto	32	12 11 0
ditto	47	3 10 0	ditto	21	2 3 6
ditto	33	6 10 0	Wh. Gorland	23	6 9 6
West Caradon	108	7 15 0	ditto	20	1 1 6
ditto	103	7 12 6			

TOTAL PRODUCE.

Wh. Maria	1288	£6866 19 0	Holmbush	118	£ 893 17 0
West Caradon	444	3122 19 0	Bedford United	103	538 3 6
Par Consols	270	1739 6 6	Wh. Providence	98	670 0 6
Mark Valley	148	492 8 0	Wh. Gorland	43	170 8 6

Average standard, 93*l.* 4s.—Average produce, 9¼.—Average price per ton, 5*l.* 17s. 6d.—Quantity of ore, 2452 tons.—Quantity of fine copper, 228 tons 2 cwt.—Amount of money, 14,514*l.* 2s. 0d.—Average standard of last sale, 108*l.* 4s. 0d.—Average produce ditto, 7¾.

COMPANIES BY WHOM THE ORES WERE PURCHASED.

	Tons.	Amount
English Copper	317	1967 16 6
Vivian and Sons	808	4915 13 0
Freeman and Co.	249	1469 8 6
Grenfell and Sons	316	1706 5 6
Sims, Willyams, and Co.	212	1326 6 6
Williams, Foster, and Co.	550	3098 12 0
Total tons	2452	£14,514 2 0

Copper ores for sale on Thursday next, at Farquharson's Hotel, Truro.—Mines and Parcels.—United Mines 1220—Treswyeen 494—South Caradon 332—Fowey Consols 803—Trethellan 134—Treleigh Consols 128—Wheal Sisters 68—Penstruthal 62—West Trethellan 21—North Downs 16—Bissow Slag 5.—Total, 2892 tons.

Copper ores for sale on Thursday week, at Serpell's Hotel, Pool.—Mines and Parcels. North Roskear 700—Consolidated Mines 585—Tincroft 440—Hallenbeagle 432—Fowey Consols 247—East Wheal Crofty 240—South Wheal Basset 221—South Roskear 200—Wheal Harriet 167—Dolcoath 159—Wheal Clifford 123—Creeg Braws 110—Ting Tang Consols 86—St. Austell Consols 52—South Wheal Francis 50—North Pool 39—Wh. Tryphena 13.—Total, 3500 tons.

COPPER ORES

At SWANSEA, for sale Feb. 25.—Cobre 105, ditto 100, ditto 95, ditto 90, ditto 76, ditto 106, ditto 103, ditto 101, ditto 89, ditto 108, ditto 91, ditto 80, ditto 75, ditto 9, ditto 30.—Cata 105, ditto 102, ditto 100, ditto 95, ditto 87.—Tigrony 66, ditto 31, ditto 26.—Crosslake 100, ditto 19, ditto 12, ditto 7.—Clill 80, ditto 54.—Ballymurtagh 95, ditto 26.—Victoria 50.—Total, 2351 tons.

NOTICES TO CORRESPONDENTS.

KIRKCUDBRIGHTSHIRE MINING COMPANY.—We have received a letter, signed "A Shareholder" (Plymouth), in which he complains of the manner in which the executive perform the duties of the trust reposed in them; he states that a meeting was held on the 3d Dec. last, at which a call of 1*l.* per share was made; and that, in about three weeks after, a copy of the accounts was sent to each shareholder, with the congratulations of the committee on their prospects, &c.; but that, from that time to the present, no information had reached the shareholders; he also complains of an engine having been purchased for the mine, which had required extensive repairs, and was not even yet shipped for its destination—so that the mine remains still idle, and the prospects of the shareholders as far off as ever. He concludes, by recommending that the larger shareholders shall request the purser to call a meeting, in order that things may be placed in a better state.—The letter itself is inadmissible, from not being authenticated by the writer's name.

LEAD TRADE OF THE UNITED STATES.—In the letter, signed "J. W.," on this subject, in our last Number, there are a few typographical errors—for instance, *for* "that a spirit had taken place," *read* "spurt," &c.; and referring to the produce of Spain, America, and England, *for* the "best," as from 15,000 to 16,000 tons, *read* "last," and *for* "memorial," *read* "masorial." There are a few others, but which are mere singular for plural, or *vice versa*, and which the reader would naturally correct.

RAILWAYS IN CORNWALL.—We have some remarks in type, in reply to those of the *West Briton* of last week; but which, together with several other matters, are postponed—including the Glossary of Mining Terms, the Metallurgical Treatment of Gold and Silver in Hungary and Transylvania, &c. &c.

THE MINING JOURNAL
And Atmospheric Railway Gazette.

LONDON, FEBRUARY 21, 1846.

We confess we are in no way surprised to find, that the "Anti-British Mineral League," have again resumed their labours—one of the first movements of the session being the presentation, on the 16th instant, of a petition from the merchants and manufacturers of Wolverhampton, by Mr. THORNELY, in the House of Commons, praying for a relaxation of the duties on foreign ores,—or, we believe, to use the words of the petition, that for the advantage of the petitioners, being manufacturers, and the smelters, the modest request, that all ores shall henceforth be imported duty free. It is quite apparent that the petitioners are determined to "go the whole hog,"—and, following in the wake of the Anti-Corn Law League, doubtless calculate on the Minister reducing the duty for three years, then throwing open the ports; and, on reference to the debates, we find that Sir R. PEEL, in the course of his observations on the benefits (?) of free trade, and the advantages which had attended the tariff introduced some three years since, put forward as evidence of the successful issue of such measure, that in the case of *feathers* a considerable advance had taken place. We can very well imagine that our readers will naturally ask the question, what feathers have to do with copper or *tin?*—except that the latter is necessary to pay for the former; but a short quotation from the speech of the Minister, will at once enlighten them, and at the same time afford us the opportunity of offering some observations on the part of the miner and the mine adventurer.

Sir R. PEEL, in his address to the House, observed that, when in 1842 the duty on feathers was reduced, it was apprehended that it would be most injurious to the British farmer, and that even the *geese* would suffer, which at that time were said to be plucked alive,—not the only ones, we apprehend, if the Premier were to carry his inquiries and observations further. According to the statement of Sir R. PEEL, a manufacturer, apprehensive of the effects of the tariff, and who at the time imported 100 tons of feathers per annum from Ireland, at the rate of 20*l.* per ton,—by his own admission, he had last year imported 300 tons from Russia,—while his imports from Ireland had increased 50 per cent., at an advanced price of 14 per cent on the prices paid, previous to the passing of the tariff. Thus, it is clear, that so far as feathers are concerned, the tariff advanced the price, and increased the consumption fourfold. Now come we to the causes to which such increase is attributable, and we find, from Sir R. PEEL's statement, that the great demand for these 450 tons, or 1,000,000 lbs., was from Cornwall,—and here quote we the honourable Baronet—"The Cornish miners (quoth he) had been prosperous, in consequence of plenty and abundance and had been able to expend a part of their earnings in *feather* goods—they had thus been able to recruit the wasted strength of the day, in consequence of plenty and abundance, not requiring that they should devote the whole of their wages to the purchase of food." (Hear, hear.) "This (says the Minister) reads us an important lesson." Read, mark, learn, and inwardly *digest*, this evidence put forward by the Minister—ye Cornish miners!—you who complain of a reduction in wages of 20 per cent.!—you who rest content on receiving 11s. to 12s. per week, for your labour, reflect on the advantages you are deriving from the new tariff, and what may you not expect from the ports being thrown open? You are told—and who so good an authority as Sir R. PEEL?—that since your wages have been reduced 20 per cent., and feathers advanced 14 per cent. you have been enabled to indulge yourselves and families with feather beds—of course, never having tasted of the luxury antecedent to that period. Is not this some slight evidence of what the miner and mine adventurer may expect from Sir R. PEEL, and his coadjutors, the advocates of free trade, by letting in copper ores free, which, of course, will yield increased luxuries, and allow even the "maidens" to wear "feathers" in their bonnets. Surely Sir R. PEEL could not have been serious when he made this statement.

It is hardly necessary to refer to the memorial submitted to the Prime Minister, by certain manufacturers and smelters, praying for the abolition of the duty on foreign tin, copper, and copper ores, to which we find that an acknowledgment, at least of its receipt, has been transmitted; while promises have been accorded, on the part of Mr. NEWDEGATE, M.P., Mr. THORNELY, M.P., and others, to support a petition to the Legislature, having for its object the abolition of the duties on foreign ores and metals.

On referring to the proceedings in the House of Commons on the evening of Thursday, we find that Mr. Alderman THOMPSON put the very pertinent question, as to whether, in the opinion of the Premier, the Cornish miner would be better off, by having no protection against the rich and shallow mines from whence ores are imported? It is hardly necessary to say, that no response was made, although, if we may judge from the report before us, the attention of the House was evidently drawn to the subject. We have not spare room this week to enter upon the subject at length, but shall resume its consideration in our next; when, by the demonstration of "facts and figures," with tabular statements of our exports and imports, and the relative prices previous to, and since the passing of the tariff—and, moreover, a reference to the rate of wages—we feel assured we shall be in a position to meet the allegation of the Anti-British Mineral League. Let us, however, in conclusion, impress on "One and All,"—and we feel assured the call will be responded to—to be up and stirring. Let them not depend on their representatives, but act for themselves. Let them not be deceived by "wolves in sheep's clothing," but at once stand forward and maintain their rights, by bold and forcible truths, so put before the Legislature, that to pass them by unheeded will but give additional evidence that, from the Premier to the Commoner, no dependance can be placed. Once again, then, we repeat—Cornishmen be steady to yourselves, and watch the coming crisis.

We have alluded, in former Numbers, to the great exertions making by many of the most scientific men and experienced engineers in France, to discover some means to economise coal in the working of steam-vessels, and steam-engines generally—that article not only being very expensive, but scarce, which obliges the Go-

vernment, and private speculators, to resort to this country for the greater portion of their supplies of serviceable fuel, from Newcastle and the north of England. A M. Trembley, after many experiments, has ultimately succeeded in discovering, that the vapour, or steam, arising from sulphuric ether, will be the means of a very great saving of fuel, as it gives an abundant distillation of salt water, which could be employed either for resupplying the steam boilers, or for furnishing the crews with their daily demand of water, for drinking, and other purposes. The inventor employs, two rotary engines properly arranged together, but with this difference, that one of them is moved, or worked, by steam from water, and the other by steam from ether. The latter one only operates by the first—that is to say, that the steam from water, after having operated in the cylinder of the first engine, is brought back, on its escape from the proper jacketted vessel, for the sulphuric ether, which is, at the same time, the generator of the steam of ether and condensator of the steam from water — so that this vapour, or steam, is sufficient to develope that of the ether, which is to put in motion the latter engine, so that the faculty of absorption of the caloric, which the ether possesses, is so powerful, that this steam of heated water is instantly condensed, and leaves a vacuum in the envelope which surrounds the generator of the ether vapour, the result of which is perfectly distilled water. The ether steam supplier has no reservoir of steam, and in reality only contains four quarts of ether to produce a power of four horses, or one quart per horse, which can be applied in proportion either to high or low pressure, and producing, at least, a saving of 50 per cent.

For, considering the economy and saving that the ether steam-engine offers may be stated the following :—1st, The small space it requires, in consequence of the small size of its boilers and condensers.—2d, In the weight from the limited quantity of liquid required for filling the boiler, and the thinness of the tubes, which compose the heating and condensing surfaces.—3d, It realises all the advantages of regular steam-engines, high and low pressure, by the condensation of the vapour of ether.—4th, When placed near the common steam-engine, it moves and produces a gratuitous force, equal to the power of the regular water steam-engine, as it absorbs the latter's steam as soon as it comes out of the cylinder.—5th, It produces by condensation, in a closed vase of this steam, a current of constant, pure, soft, distilled water, whatever may be the nature of the water employed for the production of the heated steam.—6th, Lastly, there is not the least danger of explosion or deterioration, as the boiler is only exposed to the regular heat, and at a low degree of hot water steam. This engine, considered as united, and working conjointly with a water steam-engine, will give the following results :—1st, A saving of at least 50 per cent. in fuel, as it doubly increases the power of the water steam, producing, as it does, a force more than equal to that of the latter, by the simple use of heat on its coming out of the cylinder, and without at all impeding its progress.—2d, If adopted on board of steam-vessels, boats, or in locomotives, it relieves them by a great discharge of the weight, and the quantity of fuel, as it only requires one half to produce an equivalent power.—3d, It allows the water steam-boiler to be supplied with soft distilled water, either on rivers, on land, or on the sea,—and this water boils at 100 degrees, whilst salt water not till 107.—4th, It yields this supply to the boiler of distilled water, preserving a temperature of 45 to 50 degrees—therefore giving a great saving in fuel, as, instead of supplying the boiler with water at 20 or 25 deg., which is the case with the present condensing engines, it furnishes them with water at 50 degrees.—5th, This distilled or purified water is soft, leaving not the slightest incrustation in the boiler, which consequently is no longer in danger of being too heated or burnt, and removes completely all chances of explosion, which arises from the rapid condensation.—6th, The incrustations are no longer to be feared ; the cleaning of them is but seldom required, and those easily performed,—therefore, they can employ the tubular boilers with every advantage, which is not only a great saving in weight, but in space—the greater intensity of the heat, and the better employment of fuel, without being exposed to any of the inconveniences.—7th, Lastly, the boiler only being supplied by water, produced by the condensation of the steam expended by the steam-engine, there is no fear of its rising to too high a degree in the level of the boiler. The same with the total quantity of condensation, as it is introduced in small quantities, according to the consumption or exhaustion of the engine—and the loss being scarcely perceptible in well constructed apparatus, its evaporation must be the length of time not requiring constant attention ; and as the supplying pump having only distilled water, its tubes never become out of order, and keep up the proper quantity of steam. This new engine has been approved by some of the first scientific gentlemen of France, both engineers and naval officers of high standing ; and there is little doubt that the Government will ultimately adopt it on board their steam-vessels, and of many of the railway companies, as not only a very great saving of fuel is effected, but as affording greater security.

At a time like the present, when the question whether free trade, or protection, is best for all the great interests of the country, and of that more numerous body of the population, who, in fact, are the foundation and support of all the others—the working classes—any statistics, throwing light on the subject, and tending to its elucidation, must be of the greatest importance to all who take any interest in this all-important question. The trade in coals and metallic minerals of this country forms two of the largest items in its commercial transactions, and, under every alteration of the tariffs, they have been found to flourish and increase in proportion to the unshackled freedom with which they have been allowed to be carried on ; place on a duty, down goes the thermometer of commercial quantity—remove it, and it immediately rises, not only to its former health and vigour, but increases in proportion to the rise of the population at home, and the wants of consumers abroad. In illustration of this we cannot do better than refer to the statement relative to the vend of coal in the Wear, given in our last Number, and to some remarks in that of the previous week, here it will be found that, while the tax of 4s. per ton on all coals exported was in operation—viz., in 1844—the sale was only 394,472 chals., being a decrease, as compared with the corresponding half year of 1843, of 62,367 chals. ; while the amount in 1845 had reached unprecedented quantity (excepting 1829) of 533,713 chals., or an immediate increase over 1844, when the tax was in operation, of 139,241 chals. —so far for the vend on the river Wear. We now turn to the imports into the port of London, from which we find that, including those from Newcastle, Sunderland, Stockton, and Hartlepool, Blyth, Scotel, Yorkshire, Welsh, sundries, culm, and cinders, and small coal, the total, imported in 1845, was 3,403,320 tons, in 11,987 ships. From 1833 to 1841 there had been, with trifling fluctuation, a gradual increase ; in the former year the imports having been 2,010,409 tons, in 7077 ships, and, in the latter, 2,909,144 tons, in 10,311 ships ; a gradual diminution then took place—in 1842, it was 2,723,200 tons, in 9690 ships ; 1843, 2,628,520 tons, in 9593 ships ; and in 1844, with the duty in full action, it fell to 2,490,910 tons, in 9466 ships ; the next year, as shown above, on the removal of the duty, an increased importation took place of 912,410 tons, in 2721 ships, or more than 25 per cent. In addition to this, in 1845, the quantity which passed the City boundary, at Grove Park, Herts, was 60,810¾ tons, and brought by the London and Birmingham Railway 8377 tons. Nothing can be more convincing to any impartial mind, of the impolicy of *direct* restrictions on the trade and commerce of the staple commodities of a country, and equally impolitic are protective duties against the staple commodities of another—a mutual interchange of the necessaries of life takes place, under unrestricted commerce, to the well being and advantage of all ; while, under restrictive duties, the few, for whose advantage they were made, are the only party benefitted, to the impoverishment and degradation of the majority of the population. With relation to the present coal trade of the north, a correspondent, from whom some of the above *data* are taken, laments that, notwithstanding the present enormous increase in the coal trade, coals in the London and other markets are selling at far below a remunerating price for the owners ; he observes, that "it is truly lamentable to behold, that with such a large capital invested in the coal trade of the north, and at a time when every other trade in the country is prospering, that this, one of the great staple trades of the island, should be in such a languishing condition." We give our correspondent's own language, as, we must confess, it appears to us a paradox, that, with an increase of 25 per cent. in the consumption of any article, and the consequent employment of many thousand extra hands, who are thus enabled to enjoy with their families some of the comforts of life, such a trade can be in "a languishing condition," and we also thought that the coal and iron trades of this country were never in a more flourishing or remunerative state.

We are glad to perceive, that the Minister of Public Works has at last taken under his consideration the numerous petitions made by the members of the Chambers of Commerce of St. Etienne and Lyons, as well as all the influential manufacturers and ironmasters, against the monopoly of the coal bason, or colliery, proprietors of the Loire, St. Etienne, and Rive-de-Gier, who have formed themselves into a company, to appropriate the whole of the coal mines of that rich mineral, as well as manufacturing, part of France in their own hands. We have alluded to this important subject, which occupies public attention generally in France, in former Numbers of the *Mining Journal*—as it is a monopoly in which all the extensive iron and forgemasters, as well as the silk manufacturers of the south of France, are so highly interested. The coal basons of the Loire, Rive-de-Gier, and St. Etienne, are not only the best in quality, but the most productive of any throughout the whole country ; and one great advantage is, that they are situated in one of the most industrious departments, in the vicinity of large iron works and the richest manufactories of Europe, where carbonic fuel is constantly required for steam-engines, furnaces, forges, the making of gas, and other purposes. This company, to have all in their own hands, had leased the railway from St. Etienne to Lyons for 90 years, and the canal of Givors for 70 years ; but, as in France, it requires the concession of the Minister to all companies (in which works are concerned), before they can constitute themselves into a society, we are pleased to see that their application, for amalgamating themselves with the railway of St. Etienne to Lyons, has been annulled by the Minister, and, in all probability, when they apply for the permission of appropriating the canal of Givors, they will meet the same result. It is true, that the company is composed of some of the most influential men, among whom is Count Mole ; but so great is the feeling in France against monopolies of every description, but, particularly, that of mining and railway enterprise, that the Government finds, however favourable it would wish to be to the monopolists, who are leading political characters, it dare not oppose the general demand of the mining and manufacturing interests of the southern departments, to stop a system which, if allowed by the State, would be highly detrimental to the commercial prosperity of the country.

Applications having, on various occasions, been made to us, respecting the prospects of labouring miners in the Australasian Colonies, and the possibility of obtaining a free passage there, we now readily give insertion to such information as we have been able to obtain on the subject. The great progress made, and making, in these colonies has become a subject of the most general interest, and the rapid increase in their mineral wealth, is drawing the attention of capitalists to them, as a safe and highly profitable, though distant, locality for investment. In the Journal of the 7th inst. will be found a long and able article on the mining indications of South Australia, and we last week made some remarks on her rapid progress in the development of mineral wealth. It is a most remarkable fact that, in 1843, the year in which copper ore was first exported, only 1 ton 3 cwt. left that colony ; while, in 1844, it had risen to 277 tons, value 4009*l.* 10s., and lead, 203 tons, value 2327*l.* ; and this increase is but trifling, compared with 1845, *in the first quarter* of which the export of copper was 403½ tons, value 6647*l.* 5s. 6d. In addition to these springs of wealth, there have arisen in the colonies machine and engineering manufactories, brass and iron foundries, mills, and other sources of productive wealth, which evidences that, in a period far below the time we have hitherto considered necessary for the realisation of the hopes of the colonist, Australia will become the wealthiest and the most renowned of the colonies of Great Britain. It is this promise of the rapid increase of wealth, which attracts, not only the attention of capitalists, but of numbers of the working classes, who are anxious to emigrate but not having the means of paying their passage out, are desirous to be informed if any means exist by which they can reach this British "El Dorado," by a free passage. To such we can now give the desired information—it is not generally known, that there is an establishment under Government control, called the Government Emigration Office, conducted by commissioners appointed for the purpose, where, under certain rules and regulations laid down, agricultural labourers, shepherds, country mechanics, blacksmiths, wheelwrights, &c., and, for South Australia in particular, miners are most anxiously sought after ; all these must be adults, capable of labour, and intending to work for wages, and reside in the colony to which they emigrate ; but persons resident in workhouses, or in the habitual receipt of parish relief, are not considered eligible. Those most acceptable are young married couples, without children, who must produce their marriage certificates, and none can be accepted having more than two children under seven years of age ; single women without their parents, unless emigrating with married relatives, and single men, will only be allowed to the number of the single women in the ship ; the age is, generally speaking, considered adult from 14 to 35 ; but parents, having a child above 14, the limit is extended to 40, and for each additional son or daughter, above that age, a year will be allowed to the parents. Good character is, of course, indispensable, for which certificates must be obtained ; and the emigrant must find their own clothes, in quantity and quality sufficient for health during the voyage ; they must also find their own sheets, towels, and soap, and will also, before embarkation, have to pay 10s. for every child under 14, and 1*l.* for every person above that age, which covers the expense of the cooking, eating, drinking, and sleeping utensils, which they use on board, and which they are allowed to retain on landing at their destination. Every particular may be obtained of S. Wallcott, Esq., secretary to the Board of Emigration. We have thus given the outlines of the regulations of this excellent Government establishment, by which any person wishing to emigrate may at once ascertain their eligibility, convinced that hundreds of our fellow-countrymen, and their wives and families, who find it difficult to more than exist in England, would, in the Australasian Colonies, find a plentiful, a healthy, and a happy location.

We have repeatedly noticed in this Journal the flattering reports in some of the Paris papers of the *fortunate* discoveries of rich iron and copper mines in Algeria, which are expected to yield so abundantly, that France, in a few years hence, will no longer be necessitated to resort to England, Belgium, or Sweden, for her metal. We are aware of the anti-English feeling that exists in the generality of the French press as regards our rapid commercial prosperity, not only with respect to the advancement making in iron steam-shipbuilding and machinery, but our manufactures of every description, which have the ascendancy in every quarter of the globe, but we certainly must say, that however strong such jealous feeling may exist, the public press ought not to degrade itself, by propagating the most alluring prospects of the mines of Algeria, to induce adventurers to embark in what they well know would be a certain failure, and only a delusion to the French nation, that their colony of Algeria will become some day an "El Dorado" foreign possession of *la grande nation*. It is well known that neither wood nor coal is to be met with in that barren part of the globe, to enable mining operations to be carried out successfully, even should the reported rich ores actually exist, but, as an allurement, we perceive that some of the Paris journals announce a new discovery of an extensive coal bed in the environs of Tenes, we give the following remarks on the subject from the *Journal des Travaux Publics* :—"It is within our recollection that this pretended seam of coal has been discovered now three times, but from authentic information, which we have received direct from the country, enables us to reduce these reports to their just value. At three kilometres from Tenes, near Oued-Allala, there certainly does exist a small seam of black schistus, which has been excavated at different periods. This schistus forms part of a slaty soil, and not a coal bed ; it contains several veins of a few centimetres in thickness, of a sulphurous lignite of a bad quality. Such is the origin of these periodical documents sent forth to public credulity. This seam of ligneous schist has neither power nor extent, it would, therefore, be desirable for the welfare of Algeria that more *real* discoveries were made, and that our brethren of the press should refrain from issuing forth announcements, so as to excite the curiosity, or mind, of the public, which must ultimately prove to be nothing but a fatal deception for the colony."

Price of Iron in France.—During the last week a new sale, or contract for 1,000,000 lbs. of cast metal, was concluded at St. Dizier, at 7*l.* 16s. per ton, to be delivered at St. Dizier, in portions of 100,000 lbs. each month, commencing from the 15th of April next. One furnace that could have furnished the 1,000,000 lbs., would not enter into a contract, under 8*l.*, for less than 2,000,000 lbs., deliverable at the furnace at that price. Wrought or beaten iron continues in a stagnant state, but at the same price of 16*l.* to 16*l.* 10s. delivered at St. Dizier. Flattened iron has a tendency to a rise, in consequence of some favourable information received from the department of the Loire, it has been done at 14*l.* 10s. ; it is stated that the iron merchants would have even taken it at 14*l.* 16s., if the forgemasters had stuck out for that price. On the whole, there is but very little doubt, but the iron generally in the spring will take a very improved development, as there is a certainty of a very considerable demand being made for the numerous projected railways, the works of which will then be able to be carried on without any delay when the fine weather sets in. The iron and forgemasters throughout France are anxiously looking forward to the decision of the Government as regards the admission of British wrought and cast iron, and other foreign iron, either free or at a mere nominal duty. The holders of large mines are beginning now to show an impetus and energy in working the ores that has not existed for many years, and the forgemasters are greatly increasing the number of their furnaces, so as to keep foreign metal out of the markets as much as possible,—and if admitted by the Ministers of Marine and Public Works, as is generally expected, the greater portion of the deputies, large shipbuilders, and railway proprietors and contractors, being in favour of a reduction of the duty, to compete, as far as possible, with the markets of England, and the north of Europe. It is stated that the iron furnaces of the Marquis de Boissy, in the department of the Cher, are going to be worked by a company—a project which has long been contemplated, but which will now be realised. It appears that this society, which has a capital of 800,000*l.*, has purchased the whole of the furnaces belonging to Marquis de Boisy, who will only remain a shareholder to the amount of the purchase money. The project of the company is to erect, in the environs of St. Amand, six new high furnaces blasted by coke, and to establish a canal communication by the Cher, from that town to Rosieres. The extensive iron mines in this department, and the numerous high furnaces in full operation having every facility of fuel, will render this a most lucrative undertaking to the company, and give employment to a vast number of the population, whose pursuits have for years been chiefly confined to the working of the iron and the coal beds.

The Iron Trade in Belgium.—We have weekly given the price of iron in France ; and as there has been a numerous meeting held at Brussels of the forge and ironmasters, we have now an opportunity of laying before our readers the decision which they have come to, as far as prices are concerned. The demand for iron in Belgium of late years has been on the increase, not only for her own consumption, in consequence of the progress of railways from one end of the kingdom to the other, forming junctions with those of Germany and France, but for supplying the many railway contractors in France, who are obliged to resort to that country and England for their material to carry out their lines. This demand has given an impetus to mining operations throughout Belgium, and hundreds of furnaces are now in full blast, where 10 or 12 years ago not one was to have been seen, and the ores left untouched. At present, it is different—all hands are at work ; and her mining industry is daily becoming more and more developed, encouraged (as it is) by his Majesty King Leopold, and the Chambers of Commerce, as well as the great capitalists who now fear not to embark in mining enterprise and railway speculations. The following are the prices determined upon :—Cast-iron, blasted by wood, taken at the foundries, between the departments of Sambre and Meuse, 15s. 6d. the 200 lbs. ; the Meuse, 14s. 6d. Iron, by wood—delivered free at Leige, Brussels, Mons, Namur, and Charleroi—according to quality : Sambre and Meuse (cannon iron, No. 1), 37s. 6d. ; Meuse (do.), 33s. 6d. ; edge iron and hoops (No. 2), 35s. 10d. ; do. Meuse, 31s. 8d. ; Sambre and Meuse, splitting iron (No. 3), 33s. 4d. ; do. Meuse, 30s. the 800 lbs. Cast-metal, by wood, at the foundries—Sambre and Meuse, 8*l.* 10s. the 2000 lbs. : cast metal, by coke, (No. 1), at the foundries, 13s. 9d. ; do. (No. 2), 12s. 11d. ; do. (No. 3), 12s. 1d. ; do. for refining, 18s. 6d. the 200 lbs. Iron, by coke, delivered free at Leige, Brussels, Mons, Namur, and Charleroi—No. 1, 1*l.* ; No. 2, 1*l.* 2s. 6d. ; No. 3, 1*l.* 4s. 2d., the 200 lbs. Cast iron, by coke, taken at the foundries—hard iron, 5*l.* 8s. 6d. ; middling, 4*l.* 16s. ; soft, 4*l.* 8s. 4d. the 2000 lbs. Sheet iron, delivered at Leige, Brussels, Mons, Namur, and Charleroi, 33s. 6d. the 200 lbs. Rails by coke, delivered free for railways, 25s. ; do. for coal-pits, 22s. 6d. the 200 lbs. From the above, it will be seen, that the price of iron in Belgium has increased within the last 15 and 16 years, at least 25 to nearly 30 per per cent—although there are more than five times the number of furnaces now at work than there was formerly. A great portion of the iron produced in Belgium is exported to Germany and the north.

Communication between the Atlantic and the Pacific Oceans through the Isthmus of Tehuantepec.—In our last, as well as in former Numbers, we have drawn the attention of the mining and commercial interest to the benefits which would be derived by making a ship canal across the Isthmus of Tehuantepec. We are pleased to hear, that this grand project is likely to be accomplished, as several influential capitalists are highly in its favour. The scientific survey of the isthmus, taken by Signor Gaetano Moro, an experienced engineer, at the request of Don Jose de Garay, to whom the Mexican Government has made the grant, has met with the general approbation, not only from the Royal Geographical Society of London, the British Association for the Advancement of Science, but the learned philosopher Arago, and the Academy of Sciences of Paris, as well as those of the United States. A company is, we are informed, now forming, for the purpose of accomplishing this gigantic undertaking. The advantages that commerce will derive by the facilities this navigable canal, uniting the two oceans, will be very beneficial, and open a new era to mining industry. Ships from Europe, bound to the north-western coast of America, will save a distance of nearly 8000 miles, and those of the United States from 12,000 to 14,000. By the contemplated undertaking, the coasts of the Oregon territory, the Californias, Mexico, Peru, and Chili, an extent of nearly 8000 miles, from Nootka Bay to Cape Horn, will receive a new existence. The average length of voyages from the United States, round Cape Horn, to the principal ports of the west side of America, and to the whaling districts of the Pacific, is

above four months, while, by way of the canal, it would not exceed one month, making a difference of three months each way, and six months on a voyage out and home, usually performed in about a year, except by whaling vessels; and it is universally admitted, that in consequence of the favourable direction of the winds and currents, ships proceeding from Europe to China, through the isthmus, would perform the voyage in a much shorter period than those following the present track by the Cape of Good Hope. The territories, assigned to the projector, Don Jose de Garay, by the Mexican Government, occupy an extent of 56 Mexican leagues in length, by 20 leagues in width, that is 1120 square leagues, each containing 4340 acres, thus making a total amount of nearly 5,000,000 acres. By the returns made in 1843 to the House of Commons, it appears that 417 vessels, of the aggregate burden of 164,447 tons, doubled the Cape of Good Hope, from different ports of Great Britain; 300 vessels, of the aggregate burden of 110,040 tons, doubled Cape Horn; which, supposing the number of arrivals to equal that of departures, gives a total amount of 1434 vessels and 548,974 tons, which number has since greatly increased during 1844 and 1845. We have very little doubt, that this grand undertaking will not only be a very prosperous one, but it will be the means of affording to the mining and commercial interests a quick and cheap means for transmitting the products of the New and Old World.

THE LLANVI IRON COMPANY.—A meeting of this company took place at the office in Moorgate-street, on Wednesday, the 20th inst.—Dr. BOWRING, M.P., in the chair. A dividend, at the rate of 10 per cent. per annum, was declared, leaving a considerable sum to be added to the rest of undivided profits, which now amounts to 3200*l*. It was determined to increase the capital from 100,000*l*. to 120,000*l*., and the new capital was immediately taken up by the shareholders, in the proportion of one-fifth to their present holdings. Powers were granted to the directors, to consider of the best means for developing the large mineral resources of the company. We understand, a handsome present of plate has been made to Mr. Squance, the solicitor of the company, in testimony of his valuable services.

THE MINERAL INDUSTRY OF BELGIUM.—A railway, from Liege to Namur, is now in progress, which will be of the utmost importance to that industrious mineral district, as it will afford the facilities of a cheap and quick transit, so long been wanting in the mining provinces. The following are a few of the establishments which will be benefitted by this undertaking—viz., At Huy, two distilleries. At Antheit, a lead foundry; a manufactery of zinc, called de Corphalie; a stone quarry; the coal pits of Mal-Semaine, and those of the wood of Huy; the manufactory of M. de Lamine; a lime kiln, with two quaries of flint stone; an iron mine, two galleries for the working of the mines of calamine, iron, lead, and coal. At Ampsin—the colliery of Hasquette; the colliery of the wood of Sart; extensive works of calamine and lead; the second iron factory of M. de Lamine; the alum manufactory of St. Nicholas; a distillery and brewery. At Amoy—the colliery of Cheneux, and that of the wood of St. Lambert; a distillery; two breweries; and the iron, lead, and calamine works. At Flône—the colliery of M. Vandesteen de Jehay; that of the Grand Montagne; the calamine works of the same company; also a very extensive establishment, now in progress of being built, for the treating of calamine and lead; two lime kilns, with quarries of free stone; and a quarry of blue stone. At Malliene—a colliery; a white plaster works; calamine and lead works; five grindstone quarries; and a lime kiln. At Warfusee—the colliery of Warfusee; a steam-engine mill; and a brewery. At Engis—the extensive establishment of the *Nouvelle Montagne*, with its different works of calamine, iron, and lead; the colliery called Bon Espoir; a salt refinery; a brewery; two lime kilns, with free stone quarries. At Arvirs—the colliery of Sart d'Avette. At Chockier—five lime kilns and quarries; a brewery; and two collieries. Between Huy and Chockier there are 10 alum manufactories, and several iron and lead mines. There are also numerous seams of coal and metallic mines in this district, which have hitherto not been worked, in consequence of the high charges for conveyance, which the railroad now will afford at a low rate, and give an impetus to mining operations.

IMPROVEMENT IN THE CASTING OF METALS.—The composition of the different descriptions of sand suitable for the moulding or casting of metals being a subject of the highest importance, M. Kampmann has undertaken, in the laboratory of the Royal Institute of Arts and Sciences of Berlin, to analyse the best descriptions of moulding sands that have hitherto been adopted, so that, if similar ones are not to be obtained, they may be composed. The best sorts, which were considered as giving the most favourable results, were as follows:—1. The sand of the foundry of M. Freund, at Charlottenbourg.—2. The Paris sand, above all, suitable for the moulding of bronze.—3. The English Manchester sand, generally used in the making of nuts.—4. The sand from the mine of Eayna, near Stromberg; also more suited in the making of nuts than fine casts.—All the above descriptions presented a red colour, and their analysation was made by the usual means. The 100 parts of which consisted as follows:—silicum or flint, 92·083; oxide of iron, 2·498; alumine, 5·415; and a small portion of lime.—The 2d, also consisting of 100 portions, was—silicum, 91·907; oxide of iron, 2·177; alumine, 5·683; lime, 0·415.—The 3d consisted of 92·913 of silicum; 2·708 oxide of iron; 5·830 alumine, and a small portion of lime.—The 4th, silicum, 90·625; oxide of iron, 2·708; alumine, 6·667, and a small portion of lime.—The great similitude between these different sands for casting, in a chemical point of view, is very remarkable, and shows that it is, consequently, necessary or indispensable that there must be definite proportions existing between those elements necessary to constitute the formation of castings, and possessing all those qualities which casters of metal so much seek all over the globe. From the results of the chemical analysis, it is, therefore, reasonable to conclude, according to M. Kampmann, that every description of sand, suitable for general purposes, and particularly for the castings of statues, bas-relievos, &c., can be composed in the following manner:—93 parts of quartzous sand (fine sand), 2 of oxide of red iron, and 5 of argil, as exempt as possible from lime. The above analysis will, no doubt, be interesting to all those concerned in the casting of metals, as it gives the exact proportions of the different substances of which casting sand is generally composed, without which it is impossible to make substantial mouldings.

A NEW STEAM PROPELLER.—The new steam propeller of Messieurs Fevard and Mercier is of a remarkable simplicity. It has neither furnace, boiler, cylinder, nor piston: it is composed of a single organ, forming of itself the furnace, boiler, and propeller. This new steam-engine is of that description known under the name of *reaction*; it differs essentially, however, from all apparatuses hitherto proposed for utilising the force of reaction of a steam jet or tube. It is constructed as follows:—A hollow axis, supported vertically in the centre of a tripod, which maintains a horisontal table; an iron tube, twisted round several times on itself, is disposed in the form of a cylindrical screw on the table, which tube adheres by its lower extremity to the vertical axis, of which it forms, as it were, the continuation: its upper extremity terminates by a tightened orifice, directed according to the tangent. A cone of cast metal rises in the centre of the rolled tube; a *tremie*, or sieve, fixed to a second table, or plain, serves as a cover to the apparatus. The vertical axis is furnished with a pulley, so as to transmit the power by a leather strap; an upper reservoir or an organ of injection, forms the compliment of this curious machine. It works in the following manner:—Some fragments of inflamed coke are thrown into the sieve, or tremie, which goes over the apparatus; in falling on the top of the central cone, it distributes itself in a circular manner round the base; the confined space between the cone is filled. The furnace well furnished, the fire lights up, the tube becomes heated, and very soon the engine becomes ready to turn: it is sufficient that a small stream of water, descending from an upper reservoir, or injected by a pump, penetrating into the circumvolutions of the tube, passing through the hollow axis, is transformed into steam, so that, by escaping by the tangent, the power of reaction of the steam pipe communicates an angular quickness to all the apparatus. The centrifugal power, resulting from the rotary movement, causes air to pass through the confined slits in the base of the central cone; the fire is blazing, the heat of the tube increases, the evaporation becomes greater; the movement redoubles; this progression of effect continues; the velocity becomes enormous; the resistance, which serves to moderate it, will be the indicator of the useful working of this propeller. This steam-engine differs from all those that have hitherto been imagined, up to the present day, not only in its method of construction, but particularly by the special manner with which the steam is employed by this organ. Instead of being directed from the generator of the steam apparatus, and to undergo while on the road, or at the moment it produces its useful effect, all the losses due to the diminution of the volume, —the result of numerous causes of cooling—the steam is maintained at a high degree of temperature in the generator tube, and the relations of the surfaces heated by water injected, are calculated in that manner, so that the heat shall not escape from the orifice, which, having obtained an increase of temperature, allows it to act, at the same time, as steam and diluted gas. This is quite a new application. M. Seguier presented this machine to the Academy of Sciences at Paris.

IRON AND STEEL TRADES OF AMERICA.

The following table shows the annual imports of iron and steel, of all kinds, into the United States for the last 16 years:—

Years.	*Tons.*	*Value.*	*Per ton.*
1828–29	36,314	$ 2,417,299	$ 66
1829–30	40,644	2,340,964	56
1830–31	51,581	2,235,563	49
1831–32	73,079	3,697,380	49
1832–33	80,289	3,371,867	41
1833–34	78,190	3,988,398	51
1834–35	77,597	3,710,103	47
1835–36	96,220	5,359,131	55
1836–37	102,865	6,363,183	62
1837–38	74,762	4,036,963	54
1838–39	115,637	6,688,596	57
1839–40	72,769	4,341,086	59
1840–41	112,111	5,020,416	44
1841–42	107,392	4,332,000	40
1842–43	37,405	1,665,651	43
1843–44	102,277	3,968,883	37
Total tons	1,261,074	$63,837,526	

ON MINING SCHOOLS IN WALES.

We have been favoured with a lengthy paper on the Importance of Establishing Mineralogical Schools in Wales, by Mr. S. Gibson, some extracts from which will be interesting to our readers; we should be glad to be favoured with communications on the subject, and at all times shall be ready to lend our aid in promoting the desirable objects of the writer. Mr. Gibson first calls attention to the situation of the principality, observing that no part of her Majesty's dominions presents more urgent claims for mineralogical schools: owing to the vast amount of industry and capital employed in her mines, she claims from the State the aid of science, to assist the untutored efforts of the people in extracting minerals, which are so important to the manufactures and commerce of the country. The subject viewed as a science forms the extensive study of mineralogy, and regarded as an art presents us with the labour of the miner, and in each of these the aid of many other arts and instruments are required. All the states of Europe have founded schools of mineralogy; England and Wales are alone behind hand, and it is absolutely necessary that the attention of the Government should be called to the subject. Many instances are given of parties wasting their time and money by working without system or knowledge. Mr. Murchison records one at Tan-y-coed, where he found a credulous farmer ruining himself by excavating a horizontal gallery in search of coal, an ignorant collier being his engineer—which case may serve as a striking example of the coal boring mania in districts which cannot contain that mineral. The science of subterranean geometry is of essential value—without this, it is impossible to execute mines with art and economy, or safety to the lives of the labourers. Geological mapping is another most essential branch of knowledge. Werner denoted genera by colours. Humboldt, in 1804, formed a table of strata, for the use of the mines of Mexico, in a manner which he termed pasigraphic mapping, for the primitive, intermediary, and secondary rocks of America, as equivalent to those of Europe. English manufactures derive great benefit from the Welsh mines. It is from the purity of its galena that the Potteries of Staffordshire have maintained their superiority in foreign markets, as it produces a finer glaze, and makes more beautiful pottery than any others. Wales is also rich in fossiliferous marble; the shelly carbonate of lime of South Wales, and the encunitic of North Wales, are more beautiful than the Purbeck limestone, while the serpentine of Rhos Kolin is equal to the *verd antique* of Genoa.

It appears to be a fact not generally known, that schools of metallurgic chemistry were in existence in Wales, previous to the reign of Edward the Third; such was the college of the Pherillt in Dinas Pharaon, in the Snowden district, a branch of which was founded in South Wales; in these establishments they had digested all the knowledge of the period into books now entirely lost, and it was these schools which gave to these arts the name of Celveyddau Pherillt. Wales is undoubtedly well calculated for such schools, as possessing a disposition of strata from which the whole of the primary and secondary formations can be studied, and consequently those in which the most important minerals are found.

THE GAUGE QUESTION.

The long-expected report of the commissioners, Sir. F. Smith and Professors Barlow and Airey, on this highly-important, but simple, question, has just made its appearance, and, after many months of sagacious investigatton, and the production of a document of the most voluminous kind, they tell us, after all, nothing but what we have repeatedly iterated in this Journal—viz., that the mixture of the gauges was ridiculous, and could not be supported; that the narrow gauge having been forced on the earlier railway companies by the Legislature, all future companies ought to be compelled to adopt it; that all the advantages and facilities appertaining to the broad gauge could be obtained on the narrow; and that, as railways become extended, the Great Western lines should (with, of course, proper compensation) be altered to narrow. The commissioners first inquire, if the break of gauge would be an inconvenience, under the following heads:—1, Express trains; 2, Mixed trains; 3, Goods trains; 4, Carriage of troops and stores—and in all these they unequivocally state they find there would be inconvenience, delay, and danger. They next inquire into the best means of obviating, or mitigating, the evil, supposing it existed; and here—under four heads, in which are considered telescopic axles; broad gauge truck, with narrow gauge rail upon it; shifting carriage bodies; and carrying merchandise in loose boxes, so as to shift from one rail to the other—they come to the wonderful discovery, that none of them can, with any regard to safety, accommodation, speed, or economy, be adopted, and express their opinion that equalisation is desirable. After multifarious disquisitions on the above four questions—viz., safety, accommodation, speed, and economy—from each of which deductions are drawn which cannot be misunderstood, the report recommends, that the gauge of 4 ft. 8½ in. be declared by the Legislature to be the gauge to be used in all public railways, now under construction, or hereafter to be constructed, in Great Britain.—2. That, unless by the consent of the Legislature, the directors of any railway should not be permitted to alter the gauge of such railway.—3. That in order to complete the chain of railway communication from the north of England to the southern coast, any suitable line from Oxford to Reading, and from thence to Basingstoke, or by any shorter route, connecting the Oxford and Rugby line with Southampton, be promoted; and 4, That it is desirable that some equitable means should be found, of producing such an entire uniformity of gauge, or of adopting a course for narrow gauge trains to pass on broad gauge lines, without interruption or danger.

In an appendix to the report, it appears that, of the grand total of railways made, sanctioned, or likely to be sanctioned up to July, 1845, the narrow gauge, of 4 ft. 8½ in. extended over 4131¼ miles; and on the broad gauge, of 7 ft., over 777¼ miles. Although we have never, for a moment, believed that any commission could have come to any other dicision, than that expressed in the report before us, still we cannot help bearing our humble testimony to the deliberate, scientific, and highly satisfactory manner in which the commissioners have executed their delicate task; inferences drawn from the most abstruse inquiries, and statistics in minutest detail, have evidently laid the foundation of the report, and the conclusions to which its framers have arrived; and we trust, for the quietude of all concerned in railways, that the question will now be set at rest for ever.

RIVETING BOILERS BY STEAM.—Messrs. Garforth and Brothers, of Dukinfield, have lately constructed a machine for the purpose of riveting boilers by steam. The machine, which is made upon a most simple principle, will, with the aid of two men and two boys, perform the work of 60 men upon the old plan. One good quality which this machine is said to possess, in addition to many others, is, that in riveting no noise, which can be heard beyond a few yards, is made in the process. The machine will secure seven rivets per minute, and, in clenching them, throws upon each the force of 20 tons. It is worked with a piston, the same as in a common engine, and takes very little steam.

COLEMAN'S LOCOMOTIVE ENGINE.—We have before alluded to the model of this engine, for ascending and descending inclined planes, deposited at the Royal Polytechnic Institution: we now find that the directors are about erecting a railway, with a gradient of one in 10, and extending the whole length of the building, to enable engineers and others to form a better estimate of the merits of the invention. We also learn, that the building is to be much increased in magnitude—that more attention than hitherto may be devoted to the subject of steam locomotion.

PROGRESS OF FRENCH MINING INDUSTRY.

[FROM OUR PARIS CORRESPONDENT.]

On the 13th March next, the Department of War will receive tenders for the supply of 278,000 kilogrammes of new Russian copper, and 27,900 kils. of Cornwall tin. Of the copper, 138,000 kils. are destined for the foundries at Strasbourg, 70,000 for those of Douai, and 70,000 for those of Toulouse; of the tin, 17,500 kils, are destined for Strasbourg, 8000 for Douai, and 2400 for Toulouse. The conditions on which the tenders will be entered into, may be ascertained at the offices of artillery in Paris. It is said that the tin and copper to be contracted for, are intended for the armaments of the fortifications of Paris, and that they are but a small portion of what will shortly be required.

The treaty of commerce between France and Belgium is submitted to the Chamber of Deputies, and will shortly come on for discussion. Its provisions are chiefly on calicoes, linens, silks, wines, and other articles, with which your readers have no particular concern. They contain, however, a clause to the effect, that the surtax on Belgian machinery imported into France, shall be abolished, and that the machinery shall be admitted on exactly the same terms as that of England. This will have some effect on our importations, but not enough to cause any inquietude. The importations of coal and iron from Belgium appear to be greatly on the increase. In 1844, the quantity of coal received from Belgium was about 160,303 tons, more by 138,070 tons than in 1842; in the same year, the quantity of cast iron was 31,313 tons, more by 25,691 tons than in 1842. Great part of the latter comes to France, to be manufactured into different articles, and is then returned to Belgium. The increase in the importation of coal and iron, coupled with the extraordinary development of the production of France itself, shows strikingly the enormous demand which exists for those articles—a demand which is every day on the increase.

The majority of the shareholders of the St. Etienne Railway have voted for its concession, or sale, to the United Company of Mines; but the Lyon newspapers assert that the Minister of Public Works has peremptorily refused to sanction any such measure, and the minority of the shareholders are adopting proceedings to prevent it. The plan of amalgamating all the mining companies of the neighbourhoods of the Loire into one great concern was to have been completed (as was stated in the Paris correspondence of the *Mining Journal* some time back), by obtaining the monopoly of canal and railway transit. The amalgamated companies have already grasped the canals, but it appears that their clutching of the railway is likely to be baulked—if so, one of the most gigantic schemes of monopoly ever planned will be knocked on the head. Even this amalgamation itself can scarcely be considered definitive, for the Minister of Public Works has not yet authorised it; it is warmly opposed at Lyons.

The *Journal des Travaux Publics* denies that any discovery of a coal mine has been made in Algiers, as was stated in the *Mining Journal*, on the authority of a Marseilles newspaper. The pretended mine near Tenes, is, says the *Journal des Travaux Publics*, nothing but a vein of black schistus, which is not coal, and will not burn. I cannot take upon myself to decide between these two opposing authorities; but, perhaps, the chances are that the *Travaux Publics* is right, for if coal had existed in Algiers, it would, probably, have been discovered long before this, considering the minute researches that have been made for it.

The extensive iron mines and forges of the Marquis de Boissy, in the department du Cher, are about, it is said, to pass into the hands of a company, which designs to bring a great capital into them, and to work them with all possible energy and activity. The price the company has agreed to pay to the Marquis de Boissy is 20,000,000 fr, (800,000*l*.), but it is to be taken in shares, not money. Cher is one of the most important iron districts of France, and the possessions of the Marquis de Boissy are among the largest therein.

The iron interest of the department of the Haute Marne is at present agitated by discussions, as to the direction to be taken by the Paris and Strasbourg Railway. In support of its views it sets forth the importance it possesses. Thus, it says, that the cast-iron, and the iron produced or elaborated in the Haute Marne, are of the value of 14,364,606 fr. (upwards of 500,000*l*.); it produces more cast-iron than any other department, and is second in the production of iron; of the 615 furnaces in France it possesses 82, of which 72 are in operation; it produces one-eighth of the general total of cast-iron manufactured in the kingdom, and one-twelfth of all the iron sent from all the forges; it would produce more raw iron, were it not for the dearness of fuel. Ore is abundant, and costs only 1 fr. the 100 kil., delivered at the furnaces—its average yield is 40 per cent.; the number of water falls, &c., supply economically the place of costly steam-engines; and, finally, there is a numerous population, willing to work hard for moderate wages. Such is an epitome of the most important iron district of all France. It is favourable enough as far as it goes, but you will see that it is not to be compared with those of England, Wales, or Scotland.

M. de Blanqui, a celebrated professor, a learned writer on political economy, and a staunch free trader, is advocating the principle of the removal of all restrictions on commerce, in a series of letters to *La Presse*. In the course of one of his recent communications he falls foul of the ironmasters, for their monstrous selfishness in presuming to oppose the abolition of the duty on iron for shipbuilding; and he reminds them that, 10 years ago, they pledged themselves, that if protection were afforded them for five years only, they would demand no more; yet, with twice five years' protection, they now dare to resist such a modification of their protection, as will save the merchant marine from utter annihilation. This astounding bit of impudence, on the part of the ironmasters, really approaches the sublime. But it is not only, says M. de Blanqui, to the shipping interest that you ought to be called upon to make concessions —every other trade demands it—the whole country demands it. He is right. The dearness of iron is a heavy burden on the whole community. It may, indeed, be almost likened to the tax upon corn in England, for, in the present day, it is no exaggeration to say, that iron is almost as necessary as bread. And the community at large is beginning to see that. The agricultural interest is already scratching its head, and hinting that, if it could obtain its tools, its ploughs, its harrows, its carts, its waggons, somewhat cheaper, it would be very glad, and it has a sort of dim idea that all this would be obtained by a reduction of the duty on iron. The railway interest demands the reduction. The building interest demands it, for every day the use of iron in building is becoming more extensive. The manufacturers of machinery, the persons who employ machinery—and, in short, all persons, engaged in trade and manufacturers—would rejoice at the reduction of the duties on iron, and would rejoice still more at their entire abolition. Unfortunately, nothing betokens that a general reduction is to be expected; but still it must not be despaired of. The stone has been set rolling, and it will arrive at its destination before it stops.

Great activity prevails in all the *usines*, and large orders are arriving daily. Prices of iron are expected to increase pretty considerably. At the last markets the ironmasters might have obtained an advance, if they had taken the trouble to remain firm.

The most important item of news in the railway world is, that the report of the engineer, appointed to examine the works on the Rouen and Havre Railway, is in favour of their solidity.—*Paris, Feb.* 17.

POWERFUL NEW LIGHT.—M. Gaudin, an experienced French experimentalist, has, for a long time, devoted his attention to the best means of lighting steam-vessels. We give the following translation of his letter on the subject:—"Having occupied myself for several years to the application of what is called the Drummond light, I have succeeded to produce, without employing the hydrogen in substituting that of the smoke, or vapour, of ether or alcohol; I have constructed on those principles an apparatus of lighting, which I call *fanal sideral*, and it has been duly investigated by the Minister of Marine. It has been proved that this light, the power of which does not exceed that of 15 wax lights, allows a captain of a vessel to discern at nearly two miles distance. Having been commissioned by the Minister of Marine to apply it to the steam-vessels belonging to the fleet, I went to Toulon, and after many experiments, and that in most boisterous weather, it was proved that the other, or alcohol, light was quite unextinguishable, and could be seen by the glaring at nearly any distance. The light in question is composed of a reservoir of oxygen, from which the gas runs under a pressure of three or four millimetres of mercury, and issues forth into the centre of a flame of alcohol by a vertical tube, which occupies the axe of the match, and carries to its summit a little hole; the vertical dart thus produced, causes a small globula of magnesia and soda to a platina wire. The consumption of oxygen is about 17 quarts per hour. I have no doubt this light would be beneficially applied to railway trains and mails, as it will show a light at nearly 500 yards, and also for night signals, at a great distance, for the army in Africa, as the light can be distinguished, according to the axe, from 24 to 30 miles, and would serve as a telegraph communication by the number of eclipses, or a successive change in the colours.

Original Correspondence.

MINING IN AMERICA—LAKE SUPERIOR COPPER REGION.

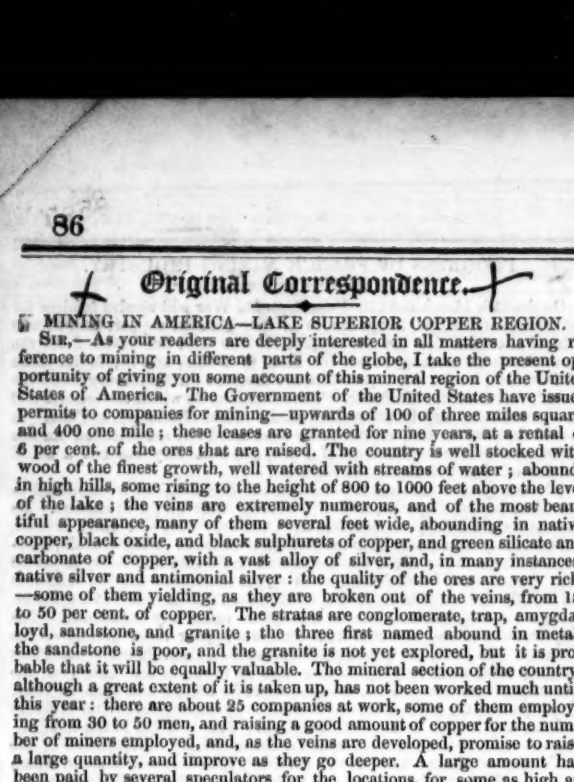
SIR,—As your readers are deeply interested in all matters having reference to mining in different parts of the globe, I take the present opportunity of giving you some account of this mineral region of the United States of America. The Government of the United States have issued permits to companies for mining—upwards of 100 of three miles square, and 400 one mile; these leases are granted for nine years, at a rental of 6 per cent. of the ores that are raised. The country is well stocked with wood of the finest growth, well watered with streams of water; abounds in high hills, some rising to the height of 800 to 1000 feet above the level of the lake; the veins are extremely numerous, and of the most beautiful appearance, many of them several feet wide, abounding in native copper, black oxide, and black sulphurets of copper, and green silicate and carbonate of copper, with a vast alloy of silver, and, in many instances, native silver and antimonial silver: the quality of the ores are very rich, —some of them yielding, as they are broken out of the veins, from 18 to 50 per cent. of copper. The stratas are conglomerate, trap, amygdaloyd, sandstone, and granite; the three first named abound in metal, the sandstone is poor, and the granite is not yet explored, but it is probable that it will be equally valuable. The mineral section of the country, although a great extent of it is taken up, has not been worked much until this year: there are about 25 companies at work, some of them employing from 30 to 50 men, and raising a good amount of copper for the number of miners employed, and, as the veins are developed, promise to raise a large quantity, and improve as they go deeper. A large amount has been paid by several speculators for the locations, for some as high as $6000 for one three-mile section, and prices are now advancing considerably. As you might expect, there is not much good mining among them; but they are employing Cornish miners, and bid fair to mine effectually during the next year. Their stamping machinery is ineffectual, and the system of dressing their ores bad. They have it in contemplation to commence smelting on the mines next year; and, from the excitement prevailing among the capitalists, it is probable that next year a vast tract of land will be mined, and very many miners employed—they are giving to miners $25 per month, and board and longing.

The expenses of conveying the ores to Boston, for smelting is $15 per ton—the per centage of copper in the ores so conveyed is from 60 to 80 per cent. From parties here, who have visited the Canada shores of Lake Superior, I learn that the veins are more valuable there than on the American side, and they are very desirous of engaging property on the British side.—R. KERNICK, Jun.: *Copper Harbour, Lake Superior, Dec.* 16.

FOSSIL TREE IN DUKINFIELD COLLIERY.

SIR,—During last month, I happened to be underground at Dukinfield Colliery, near Ashton-under-Lyne, at the time when the miners were just discovering a very remarkable fossil tree, which lay embedded in the grey shale immediately under the cannel coal, and which is 1100 feet below the surface. The owners gave directions that as much as possible of it should be extracted, which was accordingly done, and it will shortly be presented to the Manchester Geological Society. It seemed to be grouped with several other trees, but they were short, and united almost imperceptibly with the shale, although with a coaly formation around them half an inch thick, resembling the bark of a tree. The principal specimen was remarkably circular and perfect, and so entirely disconnected with the shale, that it was easily raised from its bed, although it was difficult to effect that without breakage. The fossil itself is grey shale, of a similar nature to that in which it is embedded; but the extent of its branches could not be ascertained. It does not seem to come at all in contact with the seam of coal, although close underneath it, and the adjoining shale contains several irregular layers of rich ironstone. If any proof were wanting of the theory of these fossil remains, a fact of this sort cannot fail to be conclusive; but the enormous depth of strata from hence to the surface, does but set at defiance the finite judgment of man as to the time necessary to form such an immense deposit of strata. The drawing is made from actual admeasurement—the whole length being upwards of 17 ft., and the branches varying from 4 in. to 12 in. diameter. Suffice it to say, that it is the most perfect specimen I ever saw, and as such think it may be welcome to many who take an interest in the subject.—MATTHIAS DUNN, *Mining Engineer. Newcastle-on-Tyne, Feb.* 7.

Drawing of a Fossil Tree, as found in the Shale, beneath the Cannel Coal, at the Dukinfield Colliery, January, 1846—*Depth from surface,* 1100 *feet.*



Scale of drawing—four feet to the inch; total length, seventeen feet.

a a a—Ironstone layers.

b—Cannel coal seam, lying at an angle with the horizon of 40 deg.

GREENHOW'S GEOMETRICAL RAILWAY—SOCIETY OF ARTS.

SIR,—I beg to be allowed to trouble you with a few remarks on the proceedings which took place at the Society of Arts, on Wednesday evening last, after the reading of my paper on the danger of diverting the centrifugal force of bodies in very rapid motion. When I had finished reading the paper, questions were poured in from all sides in "glorious confusion" —not being brought forward one at a time, allowing me an opportunity to reply to one, and to remove the objections before another was proposed, but completely producing such a medley as to prevent any party interested in the discussion of the subject, from at all understanding what was going on—while, at the same time, the effect or impression calculated to be produced on his mind was, that my principle and mechanical deductions were wrong; whereas, had I been allowed to answer each objection by itself, and the discussion for the moment been strictly confined to the *one point* before the meeting, I might have been able to put a very different face on the matter. I, therefore, call on those parties who were so ready to find difficulties in the way of carrying out my proposals, and to throw suspicion on the results of the mechanical arrangements, to state, fully and fairly, through the medium of your columns, or other course, their objections, in order that I may have an opportunity of answering them, and that the public may have the matter laid before them in its true light. As an Englishman, all I ask is, a "fair field and no favour." I am sorry to be obliged to mention the name of one gentleman—Mr. John Scott Russell, the secretary to the society—who certainly assumed too much, standing, as he did, in relation to the meeting, speaking and acting in a manner which might lead, at least, a stranger to suppose that the society was an appendage to him, instead of his being an appendage to the society—"*Ego et rex meus.*" As it drew near 10 o'clock, the time for closing the proceedings, this gentleman, apparently putting the chairman on one side, proceeded to state that the centrifugal force had *never* been known to throw a train off the line, evidently with the intention of leaving the impression on the minds of his auditors (by having the last word) that there was no danger to be apprehended from its *ever* doing so. Now, I beg leave to differ entirely from Mr. Russell, and will merely ask him—Why on the Norfolk line, the train went off the line, if it was not occasioned by the diversion given to the centrifugal force by the imperfect chair? Perhaps he may be able to enlighten me on this subject; at the same time he can, of course, tell us the cause of the accident which took place on the Great North of England line, during the experiments by the Guage Commissioners, when the engine was thrown over—if such accidents were not caused by the great power given to the centrifugal force by the very rapid rate at which the train was going? I might mention many others, but these having occurred so recently, will be in the recollection of every one. I will just ask one more question on this subject—will Mr. Russell tell us why the speed of a train cannot exceed a certain ratio, without its safety being endangered?—and, if that danger does *not* arise from the centrifugal force as he alleges, will he then be pleased to state to what cause it is attributable? He, with many others, also stated, that suspending a body like a pendulum did not alter the centre of gravity; I will not at all dispute this point, but had Mr. Russell and the other gentlemen who took so active a part in the medley, been desirous of eliciting the truth, they would have examined and perceived that I do not allow the pendulum to vibrate; but, by restraining it, throw the weight between the points of suspension, and that where it is restrained, the centrifugal force acts perpendicularly between those points. I may here observe, in justice to myself, and the principle advanced in the paper, to which I have referred, that had the several gentlemen, who took so active a part in the discussion, first consulted the diagrams and examined the models, much time would have been saved, and they would not have committed themselves in a manner, which too strongly proved them *tyros* in the science, on which they professed to advance their opinions. One other word; I think the members of the society, and the visitors present, will admit, that it was hardly fair, on the part of the secretary, to interrupt a discussion by a lengthened peroration, and wind up the proceedings of the evening, without affording me an opportunity of replying to the arguments, if such they might be termed, advanced by that gentleman and other members. I beg to thank him for his counsel, and, should I not avail myself of it, I must, at least, tender my thanks for his good intentions. I will now conclude, by repeating, that I shall be glad to reply to any objections publicly made, and bearing the signature of the writer. C. H. GREENHOW.

Cecil-street, Strand, Feb. 20.

P.S.—Being fearful of occupying too much space in your columns, I defer until next week my explanations on the different points at issue.

[We regret that our correspondent should have cause to complain of the course pursued at the Society of Arts, on Wednesday evening, as we feel assured that Mr. J. S. Russell, the able secretary, and to whom the society, as a body, may be said to be under many obligations, for the interest he has manifested, could only have had one main object in view. We are free to admit, that Mr. Greenhow has cause for complaint, in the opportunity not having been afforded him of replying to the points raised by the worthy secretary himself, who, we allow, had "the last word." It is, we believe, usual that the party introducing the paper should have the benefit of reply, or, at least, that if time did not permit, the discussion might be resumed on another occasion. In the present instance, we regret that Mr. Russell should have put an end to the discussion with his own address, which, certainly, savoured more of the dictatorial than the argumentative course, which we should have expected from that gentleman; however, as, we understand, the diagrams and models will be on the table next Wednesday, when the minutes will be read, with a *resumé* of the proceedings, we doubt not, an explanation, satisfactory to all parties, will be the result.]

GREENHOW'S GEOMETRICAL RAILWAY—SOCIETY OF ARTS.

SIR,—Having seen many notices of this proposed new species of railway one which would entirely subvert the present system, both in the rails and carriages—and heard Mr. Greenhow read his paper at the Society of Arts, on Wednesday evening last, perhaps you will allow a few remarks in your highly useful publication on the subject. Mr. Greenhow is evidently a good mathematician, and could, most probably, solve all the problems in Euclid on the subjects of gravitation, the application of the square to the circle, &c.; but I fear, that in his application of mathematical science to the useful arts, he has, in this instance, relied upon theories which he will find can never be carried out in practice. That there are some good points about his invention, I think, cannot be denied; but these do not certainly lay in the carriage being suspended on a pivot, the enormous ugly frame work, which would be required to be of sufficient strength, or, in his carriage being built on a separate frame from that to which the wheels are attached, with the springs between them; nor, in his ugly wheels, like those of an old-fashioned country cart, with the spokes at an angle of 22½ deg. The circular rail would, however, I think in practice be found to have many advantages—viz., less expense in construction, less wear and tear in use, from less friction, and greater safety than the flange. I believe that a cast-iron rail, made of the form and size proposed by Mr. Greenhow, of *cast*-iron, would be strong enough for all general purposes (although fractures would, of course, occasionally take place, as they now do in wrought rails), and the wheels cast with a semi-circular circumference would, of course, be as cheap as with the flange—there would thus, on the score of economy, be a saving of the difference between wrought and cast-iron, and also in the chairs being cast on the rails as proposed. As to the subject of friction, I am satisfied that it is enormously in favour of a circular rail; nor could all that Mr. Scott Russell said, at the Society of Arts, convince me to the contrary—(by-the-bye, did not that gentleman rather overstep the bounds of his duty, whatever his own opinion might have been, in passing a sweeping censure against an invention which the committee had permitted to be brought before the society; and also, in dictating to gentlemen to what purposes they ought to turn their inventive faculties?)—I am quite aware, that the inner portion of the grooved wheel, and the outer, are of different radii from the centre; and all that Mr. Russell said would take place is true, if the wheel was *fixed*, and turning on one portion of a cylinder; but such is not the case, when the wheel is *progressing along a cylindrical rail*; and if a trial is made on a fair scale, I feel assured that a wheel and rail on Mr. Greenhow's plan will be found to work with nearly as little friction, as a flat-faced wheel on a plane surface; but I should have a wheel, as at present in use, with the spokes at right angles with the axis. Greater safety may be inferred from the foregoing premises. The observations, made by some members of the society, really seemed to evince an utter ignorance of the first principles of engineering science, and one (I think I heard his name was Rettie), who treated the whole invention as a farce, framed all his observations, as if railways were constructed with one rail raised 22½ deg. above the other, forgetting that Mr. Greenhow only wished to show to what *extent of sinking* in a rail his carriage would be safe. I cannot help thinking, there was evinced a vast spirit of prejudice by the engineers present, and a desire to crush all attempts at improvement; but, in spite of this, I would advise Mr. Greenhow to persevere, and although there are portions of his invention which would never succeed in practice, there are others which, with modifications, would be of great advantage, both to railway proprietors and the public. AN ENGINEER WHO LIKES FAIR PLAY.

Lambeth, Feb. 20.

CHEPSTOW, FOREST OF DEAN, AND GLOUCESTER JUNCTION RAILWAY COMMITTEE.

SIR,—It was not till this morning that, for the first time, I saw your Journal of the 31st ultimo, with a partial report of the meeting of the shareholders of the above company, held at the London Tavern, on the 30th ultimo, wherein my name appears, and coupled with assertions, which appear to be uncontradicted,—and, therefore, of necessity casting an imputation upon me for the part taken by me in the proceedings of that company. I will not attribute to you any intention wilfully to suppress the refutation which I gave to the unfounded and unjustifiable statements made by the chairman on the above occasion; but it is due to me to state, that I gave the most unqualified contradiction to the statements, and openly designated them "lies, and damnable lies," and which were well known to him, and I challenged inquiry and investigation as to my conduct, throughout the whole of my transactions with that company, adding that I might at one time have put 4,000*l.* into my pocket by the sale of shares within my control, but I considered that I should have acted dishonorably if I had done so, and that such a course on my part would have damaged the character of the company. I also stated to the meeting, that I not only never sold a single share, but purchased several hundreds, which I then held, with those which were allotted to me by the committee of management,—and that the amount which I had received from the company for my disbursements, professional services of myself and clerks for five months, was only 1000*l.*—a sum barely sufficient to reimburse my own expenses. These facts I stated to the meeting, as your reporter is of course aware,—and I only regret that he had not deemed them of sufficient importance to embody them in his report at the proper time, but I trust that you will not deny me that justice at this late period.

It was my determination to have brought the conduct of the chairman before a jury, but I placed myself in the hands of my friends, who considered that the unqualified denial with which, at the meeting, I met the statement, was quite sufficient to protect me from the slander of the person who thought proper to make the attack. I can only now add, that I challenge the directors and shareholders to the strictest investigation of my conduct, more especially into that part of the management of the affairs of the company, which would, with the aid of men of ordinary capacity for business (as directors), have placed this company in the proud position of being an integral part of the South Wales Company; and, lastly, that instead of the shareholders sustaining any loss, they would have had a substantial investment for their capital.—W. T. H. PHELPS: *Feb.* 18.

SOUTH-EASTERN RAILWAY—MISMANAGEMENT.

TO THE EDITOR OF THE RAILWAY RECORD.

SIR,—As the question of the mismanagement of the shareholders' interests in the South-Eastern Railway is important to the public, and especially that portion residing in the south-eastern district, I consider it a public duty to explain the evils produced, which must end in extravagant charges on the general traffic, and loss of fair returns to the shareholders. In the first place, there has been a reckless expenditure to the extent of 5,000,000*l.*; and up to the present time (notwithstanding the company has for 10 years been pretending to supply the district with railway accommodation), there is not a direct line to one town, as the following statement will prove:—The distance,

By SOUTH-EASTERN RAILWAY, to		By a DIRECT LINE.
Tonbridge, is	*Miles* 41	*Miles* 28
Maidstone	56	34
Ashford	67	54
Canterbury	80	56
Tonbridge Wells	45	30
Dover	88	74
Margate	100	74
Ramsgate	96	74
Deal	100	74
Hastings	74	56

Such are the performances of the directors of the company claiming an entire monopoly of the traffic in the south-eastern district, for the purpose of taxing it with double charges created by their improper expenditure, and at the same time prejudicing the investments of shareholders; and reference to a map will prove that the main line from Reigate to Dover is only adapted to form part of a trunk line between Bristol and Dover—consequently, the company have lost the confidence of all independent residents competent to form a just estimate of the result.

If the shareholders desire to invest a larger sum in railways for the south-eastern district, it will be very much to their interest to invest with any other new company, because it is obvious that their investment must be reduced to a level with the existing debt, and in the other it may be doubled in value by low cost of construction, and increased traffic, by much lower charges. For example, if the three trunk lines, now required for the south-eastern district, cost 1,000,000*l.* each under local management, they would cost nearly 2,000,000*l.* each under the management of the South-Eastern Company, and the shareholders would be obliged to divide their profits with the holders of the 5,000,000*l.* of old stock expended on the cross-country lines. No greater proof of mismanagement can be required than the notoriously large expenditure in the professional and bribery departments, for even the town-clerk of Hastings has a costly agency; and any officer of the Government may have similar advantages, if he will only help the present managers to continue their system at the cost of the shareholders and the public.

No doubt there were some honourable men in the management, but it is a well-known fact that not one director in a hundred has had the experience requisite to protect the interests of shareholders, and millions would be saved annually if the Government Railway Board appointed competent inspectors and auditors. Had this been done in the first instance, the passengers on the Brighton, South-Eastern, and most other railways, would be travelling in first-class carriages at the rate of 1d. per mile, goods conveyed in proportion, and the shareholders receiving 10 per cent. on their investments.—J. TROUP: *Hastings, Feb.* 18.

IMPROVEMENTS IN ATMOSPHERIC PROPULSION.

[Specification of patent granted to Mr. J. MALCOLMSON, of Portlaw, Waterford, Ireland, for "improvements in apparatus used for propelling carriages on roads, and vessels on inland waters, when employing atmospheric pressure."]—*Newton's London Journal.*

This invention relates to improvements in atmospheric propulsion: the first part consists in laying down a close pipe, distinct from the ordinary traction-pipe, along the whole length of the line of railway, and causing it to communicate with the air-pumps at each station. The patentee prefers that this communication should be uninterrupted throughout the whole line (but in some situations, where a higher or lower vacuum is required, a portion of the pipe may be shut off from the rest); and the steam-engines, water-wheels, or other machines, will then work conjointly in creating and maintaining a vacuum in the close-pipe. The traction-pipe is divided, by transverse valves or slides, into suitable lengths, as usual; and these lengths or divisions are connected at each end, with a close-pipe, by branch-pipes, furnished with valves. When a train is required to start, a communication is established between the first length or division of the traction-pipe and the close-pipe, by opening the valve in the branch-pipe farthest from the station, and a vacuum being thereby created in the first division, the travelling piston will move onwards with the train. Previous to a train passing over a length of the traction-pipe, the next length should in like manner be brought in connection with the close-pipe, so that when the travelling piston arrives at the end of the first length, it may move onwards without stopping.

The second improvement relates to the construction of the pipe employed in any system of propelling by atmospheric pressure for establishing a communication between the traction-pipe and the engines. The patentee prefers that the pipe should be circular, although other shapes may be used; and he also prefers to construct the same as a culvert, with such materials as may be most convenient—say, bricks, tiles, earthenware, slate, masonry, or stone, and in some situations timber may be employed. The outer surface is covered with any suitable caulking material which will be impervious to the atmosphere, such as asphaltum or bitumen, Jeffery's marine glue, India-rubber, tar, pitch, Roman-cement, puddle, &c. The patentee also proposes to use for this purpose earthenware-pipes, or draining-tiles, or glass-pipes, which will only require to be caulked at the joints. These improvements may also be employed when propelling vessels on inland waters by atmospheric pressure.

The patentee claims—Firstly, the adoption of a close-pipe, independent of the travelling-pipe, connecting the air-pumps along the line, so that they may be kept continually and unitedly at work in creating and upholding a vacuum in the side pipe—under such arrangement the engines or other motive power may be placed farther apart, and may be of less dimensions than usual, by which a saving of first cost and fuel is effected, and also the necessity of duplicate engines at each station will be avoided, as if any engine becomes deranged, the others will be capable of performing the work. He claims—Secondly, the modes of constructing and applying pipes, above described, in all systems of propelling by the pressure of the atmosphere, where pipes are used for communicating a vacuum, and through which it may not be required to pass the propelling apparatus.

NEW SIGNALS ON THE EASTERN COUNTIES LINE.—With a view of preventing the many disastrous collisions that have happened on the Eastern Counties Cambridge line, a very effective code of signals have been established by Mr. Scott, the newly-appointed locomotive superintendent.—At each station on the edge of the up and down line of rails, tall poles have been placed, the summit of which may be seen in different parts of the line from half a mile to two miles. When a train stops at a station, or there is any obstruction, a red flag is immediately hoisted on the pole of the line of rails the stoppage is on, as a signal of danger, and is not removed until 10 minutes after the train or obstruction is removed. At night very powerful red lamps are substituted for the flags. The poles will be shortly fitted with arms, and on doubt in a short time the line will be one of the best "signalled" in the country.

RAILWAY SLEEPERS.—The Prussian ship, *Lacks*, arrived in the West India Docks, from Dantzic, has brought the large number of nearly 13,000 sleepers, used in sustaining the rails on the lines of railway in lieu of other substances.

Transactions of Scientific Bodies.

MEETINGS DURING THE ENSUING WEEK.

Society.	*Address.*	*Day.*	*Hour.*
Asiatic	14, Grafton-street	Saturday	2 P.M.
Royal Botanical	Regent's-park	Saturday	4 P.M.
Geographical	3, Waterloo-place	Monday	8 P.M.
British Architects	16, Grosvenor-street	Monday	8 P.M.
Medical	Bolt-court, Fleet-street	Monday	8 P.M.
Medical and Chirurgical	53, Berners-street	Tuesday	8½ P.M.
Civil Engineers	25, Great George-street	Tuesday	8 P.M.
Zoological	11, Hanover-square	Tuesday	8½ P.M.
Society of Arts	Adelphi	Wednesday	8 P.M.
Geological	Somerset-house	Wednesday	8½ P.M.
Pharmaceutical	17, Bloomsbury-square	Wednesday	9 P.M.
Royal	Somerset-house	Thursday	8½ P.M.
Antiquaries	Somerset-house	Thursday	8 P.M.
Royal Soc. of Literature	4, St. Martin's-lane	Thursday	3 P.M.
Royal Institution	Albemarle-street	Friday	8 P.M.
Philological	12, St. James's-square	Friday	8 P.M.
Westminster Medical	32, Sackville-street	Saturday	8 P.M.

GEOLOGICAL SOCIETY.

FEB. 4.—The President (Mr. HORNER) in the chair.

P. W. Barlow, Esq., and Dr. G. Buist, were elected fellows, and M. F. Dubois de Montpereux was elected a foreign member. The President announced the appointment of Mr. J. de C. Sowerby as librarian and curator.

A paper was read "On the Tertiary Formations of the Isle of Man," by the Rev. J. Cumming. The author commenced by referring to a former paper "On the Palæozoic Formations of the Isle of Man," and gave a short account of the ancient rocks of the island, and the disturbances that had affected them. He considered that there was evidence of the island having, at no distant geological period, consisted of four islands. At this time, the boulder-clay formation, the most important of those to be described, began to be deposited, and continued, without change, till a much more recent date—affected, however, from time to time by diluvial action. The general character of the boulders seems to indicate an origin from the E.N.E. They are of various sizes, and mixed with much loam, especially in the lower part of the formation; and a few shells have been found chiefly of recent species, but mixed with others, which appear to indicate an older Pliocene date. This deposit is well seen in the cliffs near Ramsay, and further to the north still more distinctly; it is also seen near Castletown. The author suggests that it was probably formed by the grinding up of the subjacent beds of limestone and shale by currents of water, and thinks that, as near the Stack of Scarlet the underlying beds of these old rocks are scratched and furrowed in a nearly east and west direction, the drifting current which carried along the deposit (which also contains no fragments of the trap tuff, a few hundred feet to the west) must have come from the east. He thinks, however, that disturbances took place after the deposition of at least some part of the boulder formation—affecting, therefore, that bed, and even altering its condition and hardness, as if by the action of heat, or the eruption of gaseous vapours. The question whether the granite of Barrule had been previously laid bare is, however, set at rest by the fact that boulders of that granite are associated with the clay. On the whole, the author thinks that a more arctic climate existed during this deposit, and refers its existence, and the effect it had produced, to the action of drifted ice from the E.N.E. The diluvium of the Isle of Man, a newer deposit than the boulder clay, is described as a yellow sandy loam, with particles of gravel and rounded masses of insular rocks; and in the north it is not distinguishable from the boulder clay. It has been referred to by Dr. Macculloch; but his account of its origin is not agreed to by the author, who thinks it due to diluvial action from the north. There is, however, at present some difficulty in accounting for the appearance of some kinds of boulder, and the absence of others, in it. The drift-gravel is a third formation, which the author supposes to have been formerly largely developed on the island, but which has been greatly denuded. It caps the lower hills, and spreads out in platforms. It has all the appearance of an ordinary sea-beach, and occurs at the height of about 60 ft. above the sea-level; and the author thinks that it is a drift from the north-west, deposited when the level of the land was from 60 to 80 ft. lower than it now is. Lastly, the extensive swamp of the Curragh, in the north of the island, and other alluvial beds, appear to repose in a hollow, scooped out in this drift; but to have been itself preceded by another and a more widely-spread alluvium, traces of which are still to be seen. The alluvium consists of marls; and in them the remains of the Megaceros (the great Irish elk) have been found—this animal, it would appear, having been contemporaneous with the early human inhabitants of the island.

A few observations, by J. S. Dawes, Esq. "On Sternbergia," in reply to Mr. Dawson, were then read. The author considered, from many cases that had come before him, that the appearance of a thin uniform coating of bark on the surface of columnar forms of coal plants might be the result of the carbonized vascular sheath surrounding the pith, as in Lepidoden dron, which, under such circumstances, has been mistaken for Sigillaria.

INSTITUTION OF CIVIL ENGINEERS.

FEB. 17.—The President (Sir JOHN RENNIE), in the chair.

The paper read was "On Water for Locomotive Engines, and its Chemical Analysis," by William West, Assoc. Inst. C. E. The author commenced by commenting somewhat severely on the want of precaution manifested in the choice of the watering stations on railways, where he contended that previous analysis of the quality of the water would have avoided not only considerable expenditure in subsequently procuring fit kinds of water, but would have prevented great destruction of the boilers, and inconvenience from the tendency to prime, which was induced by certain substances being either in solution or held in suspension. He then treated of the various kinds of earthy crust or fur deposited by evaporation; these he showed the various compositions of, the principal components being carbonate and sulphate of lime, whose powers of conducting heat were so inferior, that when deposited upon a metallic plate or tube, which should be in contact with the water, the caloric traversed slowly, diminishing the evaporating power of the fuel in proportion to the accumulation of deposit, and at the same time oxidating the metal with great rapidity.

The various substances present in spring or river waters, such as soda, lime, magnesia, as bases, and sulphuric acid, carbonic acid, and chlorine, which represents hydrochloric or muriatic acid, iron, and organic matters, were then reviewed, and the discrepancies in the results of analysis by different chemists were treated of, and it was shown that, although there were apparent differences of opinion among chemists, they were not in reality so great as existed among engineers on the relative merits of the locomotive and atmospheric systems, the screw, and the paddle-wheels, and the broad and narrow gauge. In treating of the "modus operandi" of analysis, the imperial gallon was recommended as an uniform standard of quantity for the chemist, as being a measure known to and understood by all, and enabling the engineer to discard the minute fractions of the chemist, and to attend with exactitude to whole numbers in results. As an instance, it was stated that an engineer might be tempted to disregard the presence of three-quarters of a grain of deposit from a pint of water; but the deposit from 1000 gallons of such water would amount to 14 ounces avoirdupois, which was a very tangible quantity. In examining the tendency of different compounds to deposit, it was shown that sulphate of lime was more disposed than the carbonate to attach itself to the plates; that a mixture of the sulphate caused a harder deposit than the carbonate alone, and therefore waters containing much sulphate should be avoided. It was shown also, that although what is termed "hard" water might be considered inferior to "soft" water, yet in the question of deposit, hardness and softness were only vague terms, and could not be accepted as positive rules, inasmuch as muriate of lime, which imparted great hardness to water, and therefore rendered it unfit for domestic purposes, was a very soluble salt, and therefore did not form any detrimental deposit or crust during ebullition. It appeared that the author could only recommend, as a means of precaution against incrustation, the selection of waters which by analysis were found to contain only soluble salts; or in situations where bad water could only be obtained, that the boiler should be frequently "blown through" in order to get rid of the dense saturated part of the water, before the crust had time to be deposited. The introduction of substances, such as potatoes, leather, shavings, &c., into the boiler, in order to prevent incrustation, by enveloping the earthy particles in a slimy coating, being inapplicable to locomotives because of the tendency to induce priming. The paper noticed slightly the various patents for preventing adhesion in boilers, and in the appendix gave the analysis of many kinds of water which had been submitted to the author professionally for his opinion.

In the discussion which ensued, Mr. Gooch demonstrated the importance of the subject to railway and steam-boat companies, and stated that his attention had been called to a process invented by Dr. Ritterbandt for preventing incrustation in boilers. That process consisted simply in the addition of a small quantity of muriate of ammonia to the water in the boiler. It had been found that this process not only effected the object proposed, but that it disintegrated and removed the incrustation already formed. In all the locomotives in which it had been used, the steam was much more readily generated, so that the blast pipes of several engines had been enlarged without diminishing this facility. There was, therefore, no doubt of a great saving of fuel being effected by the process, the expense of which was stated to be about three pence per 100 miles run of a locomotive engine. In sea-going steamers, the success of the experiment had not been less remarkable. In all these cases the water had been tested by practical chemists, without the slightest trace of iron or copper being detected, showing that there was no injurious effect upon the metal of the boiler, &c. He looked upon the process as perfect.

Dr. Ritterbandt, in a concise and lucid manner, stated the results of his investigation. It appeared that carbonate of lime was the only substance which formed a solid incrustation, the other substances being merely mixed with, and cemented by, the carbonate. That the muriate of ammonia acted as a perfect solvent on the carbonate of lime, converting it into the soluble muriate, without acting upon the boiler. He gave a practical demonstration of the action of the muriate of ammonia on calcareous water to the satisfaction of the president and members, who expressed themselves in terms of approbation of the great practical utility of the invention, and of the manner in which it had been brought before the society. The following papers were announced for reading at the meeting of February 24th:—Description of the Dinting Vale Viaduct on the line of the Sheffield and Manchester Railway. By A. S. Jee, M. Inst. C. E.—Description of the Rails, Sleepers, and Fastenings, and of the Machine for setting Sleepers on the Dublin and Drogheda Railway. By G. W. Hemans, M. Inst. C. E.—Description of the Framing and Machinery for working the Diving Bell, and for cutting the underwork of the extension of the pier at Kilrush on the River Shannon. By W. Vanderkite, Assoc. Inst. C. E.

SOCIETY OF ARTS.

FEB. 18.—E. SPEER, Esq., in the chair.

The discussion on the Portland vase was resumed before a crowded audience. Mr. DOUBLEDAY (of the British Museum), who has repaired the Portland vase, exhibited a number of specimens of ancient glass manufactures, as illustrative of the theory which he deduces as the true principles of its construction. He imagines the blue body of the vase to have been first made, and then covered with a thin coating of semi-transparent white glass, by dipping it into that material while in a state of fusion. The vase, he supposes, was next placed in the hands of the artist, who, by a process similar to cameo cutting, or gem engraving, produced the beautiful designs in relief which now adorn its surface. He also stated, in confirmation of his idea of the mode in which the vase was constructed, that while engaged in repairing it, he observed that there existed a coat of white glass underneath the handles, at the points at which they are united to the vase.

Mr. PELLATT and Mr. CHRISTIE (who are practically acquainted with the manufacture and working of glass) addressed the meeting, and quite concurred with Mr. Doubleday in the view he had taken of its construction; but from their statements, it would appear that, after all, the great merit of the work rests with the artist, as there is no difficulty at the present day in manufacturing similar materials.—Mr. DOUBLEDAY stated that the bottom of the vase did not originally belong to it,—and from the style in which it is executed, he should consider that there is a difference of 200 years in the date of their execution.—The CHAIRMAN stated that the repair of the vase is so beautifully managed, that, with the closest scrutiny, it is scarcely possible to detect a blemish.

The next paper was on Railway Locomotion, with reference to the effects of centrifugal and centripetal forces, by Mr. C. H. Greenhow. He proposes, for the purpose of increasing the safety of railway trains, to suspend the bodies of the carriages upon a horizontal axis in such a manner, that the centre of gravity being equal, shall equipoise the centrifugal force. He gives to the rails the form of a hollow circular tube, and to the flanges of the wheels a corresponding form, by which he conceives that the forces tending to throw the train off the line would be counteracted. The wheels also are so constructed, that the spokes form a strait line passing between the rails and the centre of gravity of the body: all these arrangements are designed by him to give increased safety and stability to the railway trains.

A long discussion ensued, in which many practical engineers and scientific gentlemen took an active part. It was maintained by some of them, that no increased stability was given by permitting the centre of gravity to oscillate; but, on the contrary, that the carriage would be weakened and rendered heavier—that the wheels would not adjust themselves to the partial variations and irregularities in the condition of the railway—that there would be attrition between the rails and the flanges of the wheels—and that the tubular form of rail being of cast-iron would not be safe. To these allegations, Mr. Greenhow gave various replies, and the discussion was prolonged to a late hour; when it was adjourned till next Wednesday—on which occasion a new locomotive engine, by Mr. Crampton, and a paper on the means of preventing the formation of incrustations in the boilers of steam-engines, by Dr. Ritterbrandt, are to be brought forward.

Proceedings of Public Companies.

MEETINGS DURING THE ENSUING WEEK.

MONDAY.....Wheal Norris Mining Co.—White Hart Hotel, Launceston, at Twelve.
Direct London and Exeter Railway—London Tavern, at Twelve for One.
General Association of Proprietors of Steam Shipping—Office, at One.

TUESDAY.....Tokenbury Mining Company—Liskeard, at Four.
General Steam Navigation Company—Office, at Two.
Metropolitan Railways Junction—London Tavern, at Twelve for One.

WEDNESDAY..Londonderry and Enniskillen Railway—Office, at One.
Thames Haven Railway and Dock Company—Office, at One.
South Wales Railway—Paddington Station, at Twelve for One.

THURSDAY....Hartowbarrow Consols Mining Company—Plymouth, at Twelve.
North Wales Railway—London Tavern, at One.
Londonderry and Coleraine Railway—Office, at One.
Irish Waste Land Improvement Society—Office, at One.
Southampton Dock Company—Office, at One.
Asylum Life Assurance—Office, at Two.

FRIDAY.....Arigna Iron and Coal Company—Office, at One.
Newry and Enniskillen Railway—Office, at Eleven.

SATURDAY....Bedford United Mining Company—Office, at One.
Furness Railway—Office, at Two.
Southampton, Manchester, and Oxford Junction—Office, at Twelve.

[*The meetings of Mining Companies are inserted among the Mining Intelligence.*]

MUTUAL LIFE ASSURANCE SOCIETY.

The annual meeting of the members of this society was held on Wednesday, the 18th inst., at the King's Head Tavern, Poultry, and was well attended.

On the motion of Sir CHARLES DOUGLAS, seconded by Colonel ROBINSON,

RICHARD GODSON, Esq., M.P., took the chair.

Mr. PETER HARDY, F.R.S. (the actuary), read the notice convening the meeting from the *London Gazette*; and also the minutes of the last general meeting, which were confirmed.

The balance-sheet, signed by the auditors, was read, and approved of by the meeting.—Mr. HARDY then read the following report of the directors:—

REPORT.

Having again arrived at that period of the year at which it is usual for the directors to meet the general court, and to render an account of their past stewardships, it affords them the greatest satisfaction to assure the members, that the annual investigation, which has been just completed, with all possible care and accuracy, fully justifies, in every respect, the hopes and encouragement which have been held out in former reports.

The balance-sheet for the past year exhibits an unusual—but at the same time most satisfactory—increase in the amount of new business, and marks distinctly the growing credit of the institution in public estimation. It may be in the recollection of the meeting, that the statement made at the period of the last investigation—to the effect, that 136 new policies, assuring 121,000*l.*, had been offered for the acceptance of the society during the year 1844—afforded a very considerable degree of satisfaction to the members, inasmuch as that was the largest number of new assurances ever proposed to the society in any *one* year since it had been established. The directors do not imagine that the general meeting will feel less satisfied on the present occasion with the announcement, that, during the year 1845, 195 new policies, assuring, in the aggregate, nearly 170,000*l.*, have been proposed to the society. The total number of policies issued up to the 31st of Dec. last was 1100*l.* The total number of existing assurances, at the same date, was 882. The capital sums assured under these policies amounted to 610,175*l.* 15s., and the annual income of the society, from assurance premiums, was 20,804*l.* 13s. 5d.; and the actual money capital of the society, arising wholly from the accumulation of the past premiums, exceeded, on the 31st of Dec. last, the sum of 91,154*l.* 0s. 8d. The clear divisable surplus applicable to the augmentation of the sums assured under the policies of existing members, has been this year shown by the balance-sheet to exceed 48,000*l.*, while the expense of managing and conducting the society for the past year is actually below that of some former years—and is, in that respect, considerably below the majority of other life assurance societies.

The directors congratulate themselves and the members on these results. The same striking evidences of the advancing prosperity, and of the prudent management of the society, it has been hitherto their good fortune to submit to the general meeting for many successive years; and they cannot but believe, that they are justified in entertaining an opinion that the society is gradually and legitimately obtaining a firm hold on public estimation, and that it will, by a strict perseverance in the same course of prudence and economy, ultimately become one of the most important and beneficial institutions that has ever been formed in this country. The society has now been in existence about 12 years, and the members have been just presented with the results of the twelfth annual investigation into its affairs. It will be interesting to compare these results with the results and condition of its great prototype—the Equitable Society—at the end of exactly the same period of time. The Equitable was established in the year 1762, and in the year 1774, or twelve years afterwards, consisted of—

	No. of assur.	*Sums assured.*	*Amount premiums.*	*Capital.*
Equitable.....	734	£230,000 0 0	£9,500 0 0	£33,800 0 0
Mutual.....	812	610,175 15 0	20,804 13 5	91,154 0 8

—a more satisfactory comparison can scarcely be conceived. It is true, that the subject of life assurance is now far better understood, and more universally practised, than it was at the period above referred to; but while this fact is readily admitted, it must also be remembered, that the Equitable Society stood then almost alone in the assurance world, and, consequently, commanded nearly a monopoly of the public business. The Mutual Society, on the other hand, has been surrounded, from its first establishment, by numerous wealthy and powerful competitors, and has had to encounter and to struggle in its early years with more than ordinary opposition.

The surplus of the present year has been stated at 48,015*l.* 15s. 2d., and this sum is divided in strict accordance with the principles of the society, and will have the effect of increasing the sums assured by no less an amount than 86,000*l.*—so that instead of 610,175*l.* 15s., for which the society originally undertook to be responsible, the society now engages to pay during the year 1846, the sum of about 696,175*l.* 15s., or on an average about 66 per cent. on the gross sum, which the society has received in premiums. As it has been customary to submit to the meeting in this report a statement of the additions actually made to the sums assured under the 10 oldest existing policies in the society, the directors, have ordered the following table to be prepared as usual:—

TABLE,

SHOWING THE ADDITIONS MADE TO THE TEN OLDEST EXISTING POLICIES.

1834. Policy No.	Age at admission.	Sum assured.	Annual premium.	Amount of premium paid.	Additions, 1844.	Additions, 1845.	INCREASE.
1	29	£1000	£24 0 0	£ 345 14	£202 16	£234 12	£31 16 0
2	42	2000	71 13 4	1032 14	503 16	577 18	74 2 0
3	50	2000	90 13 4	1306 12	566 8	653 0	86 12 0
4	47	2000	82 11 8	1190 0	537 10	618 16	81 6 0
5	52	1500	72 6 3	1042 0	442 4	510 10	68 6 0
6	21	500	9 12 6	138 8	91 4	104 16	13 12 0
8	53	2000	114 0 0	1643 0	652 18	805 1	152 3 0
10	35	1500	43 1 3	620 8	336 0	390 12	54 12 0
13	30	500	12 3 9	175 8	101 2	117 5	16 3 0
15	48	1000	42 10 10	612 18	276 5	318 4	41 19 0

The mortality amongst the members of the society during the last year, although rather heavier than during the previous one—as may naturally be expected in a society advancing in age and numbers—is still within the limits assigned by the society's standard table of mortality; and the number of policies surrendered, forfeited, expired, and otherwise withdrawn from the society during the year, is, as usual, remarkably small. The directors still continue to give their most anxious attention to the subject of the establishment of local boards; and they have much pleasure in announcing that, in addition to the Gloucester and Leamington branches, alluded to by them in their last report, that they have now completed the formation of two other boards—one at Liverpool, and one at Bath—from both of which they look for a considerable accession of business, and they, at the same time, continue to solicit the friendly aid of the members in promoting the formation of these establishments as the surest means of economically extending the advantages of the society. It is well known to the majority of the members, that, for the last few years, the directors have not been in the habit of confining these, their annual reports, to the general meetings, within the narrow limits of a mere exposition of the society's financial condition, or a history of its transactions for the past year; but they have also looked upon them from a somewhat higher point of view, and have regarded them as proper media for developing the principles upon which the society is formed and conducted, and for explaining the machinery by which the results laid before these meetings are produced. Influenced by this conviction, the directors do not hesitate to trespass on the indulgence of the meeting, and claim its attention for a short time, while they endeavour to give a brief and general outline of the society's scheme of division, in order to elucidate in some degree the beneficial operation of that scheme, feeling assured that the more widely its principles are disseminated, and the more familiarly they are explained, the better will the society be appreciated by the assuring public, and the more readily will every member be enlisted to promote its success, and to enlarge its sphere of usefulness.

The scheme of this society—the leading feature of which is that of a peculiar annual distribution, or settlement of its surplus—differs widely from that of every other society at present known; not indeed in the circumstance of that settlement being of annual occurence—for other societies have been instituted on a similar plan—but in the just and cautious principles on which that settlement is based. The successful operation of the scheme is fairly exhibited by the regular and progressive increase which has taken place in the annual surplus at the termination of each year. At the end of the year 1842, the surplus was declared to be 34,097*l.* 1s. 11d., or about 6s. 4d. on every 1*l.* paid as premium; in 1843, the surplus was 30,432*l.* 4s. 10d., or about 6s. 5½d. on every 1*l.* paid as premium; in 1844, the surplus was 38,685*l.* 12s. 3d., or about 6s. 11d. on every 1*l.* paid as premium; and now this year, in 1845, the surplus is 48,015*l.* 15s. 2d., or about 7s. 3½d. on every 1*l.* paid as premium. These progressive increments, although of themselves, and by themselves, they constitute no direct evidence of the ultimate security of the institution, are yet, nevertheless, indications of the extreme regularity with which a system of annual investigation is found to work. It has been formerly urged by a high authority on these subjects, that any system of annual settlement in the affairs of a life assurance society, would be marked by abrupt and startling differences in the society's condition, and attended with both danger and inconvenience.

So short a time back as the year 1800, the talented Mr. W. Morgan, the late actuary of the Equitable Society, declared it to be a matter of impossibility for any society to be conducted on the principle of an annual settlement of its accounts. His words, in one of his addresses to a general meeting of that society, were—"Can anything be more absurd, or betray greater ignorance, than to propose an annual profit and loss account in a concern of this kind, or to regulate the dividend, or call, by the success or failure of each year?"—Had this eminent man lived a few years longer, or been at that time less strongly biased, in favour of the Decennial rests, he would, undoubtedly, have long since altered this opinion, as the experience of numerous societies—some of which have been in existence from 30 to 40 years—would have convinced him that, not only is this annual investigation possible, but that it is almost essential to the scheme of any society, desirous of dealing out equal justice to all classes of its members—that it is perfectly free from the difficulties and dangers he anticipated in it; regular in its operation, and far more likely to preserve the society in a sound and prosperous condition, than the now nearly exploded, and always clumsy mode of procrastinating the periods of division to Decennial or Septennial rests. While the directors are referring to this portion of the society's plan, they would gladly avail themselves of the opportunity which it affords them to impress upon the members of the society, that it is not essential to the safety of the institution that the results of these annual rests should be always progressive in their character, nor indeed would any actual retrogression in the surplus itself indicate that the society was in reality in a less secure position than it was before. It is the very nature of a life assurance society that the experience of one year should differ (although not so greatly as Mr. Morgan anticipated), from the experience of another; and, so long as these oscillations are confined within reasonable limits, the credit of the society should remain undiminished, and its stability unsuspected. The seven full and prosperous years should be employed to fill the granary against the approach of the less abundant seven. The directors are desirous that, in this, the season of prosperity and abundance, it should be distinctly understood that the caution, with which the past annual surpluses have been determined, satisfies them that a sufficient protection is being gradually created, to counteract any unusual mortality that might hereafter occur; and they trust that equal confidence will be felt in the society, should the surplus of any future year fall below that of a preceding one. It has been stated, that other societies besides the Mutual, adopt the plan of yearly divisions; and it may, therefore, be reasonably asked, wherein the Mutual differs from these societies, and wherein consists its peculiar advantages?—Before pointing out these advantages, it will be desirable that the principles upon which a society ascertains its surplus, should be briefly described; as, without a clear understanding of this fundamental operation, no distinct notion will be arrived at of the real nature of a surplus, or of a bonus.

The surplus of every life assurance society, consists of the actual money difference at any given period of time between the societies assets and its liabilities, and is ascertained by valuing the several reversionary sums, which have been promised by the society *to its members*, against the existing capital, and the several life annuities which are payable to the society *by its members*. If the sum at which this first stated part is valued exceeds the sum of the two latter values, a society so conditioned will be insolvent, and unable to perform its various contracts, and the sooner such a society is dissolved, the better it will be for all who are connected with it. If on the other hand, the value of the capital and the society's income together exceed the value of its liabilities, the society will then be not only solvent, but in possession of an actual *surplus*, varying in amount with the amount of such excess. All assurance societies, whatever may be their nature or class, whether proprietary, mixed, or mutual, proceed to ascertain the surplus on these principles. In the first named class of societies this entire surplus is given to the shareholders, and none of it distributed amongst the assured. In mixed societies, a portion of this surplus only is given to the assured, and the remainder is taken by the shareholders. But in mutual societies, the whole surplus is allotted amongst the assured, and creates, what is technically called, the bonus. It will be immediately obvious, that however correctly this surplus may be ascertained, if it be not distributed amongst the assured, on some fair and equitable principle, the direct and beneficial object of life assurance will be defeated. Various plans have been suggested, and are acted upon, for dividing this surplus amongst the assured. The method, adopted by this society, and which is manifestly both simple and just, is to give to each member a share of this money surplus, proportioned to the sum which he has contributed to the funds of the society, so that he who has contributed *two* premiums to the capital of the society, receives *twice* as large a share of this money surplus as he who has only contributed one. Before, however, these shares become converted into bonus, another operation has to be gone through. In consideration of the various portions of the actual surplus, which have been allotted to the policies of the members, the society grants, or undertakes to pay, corresponding amounts of additional assurances, more or less in each case, according to the age of the assured—or, in other words, exactly so much assurance is granted, payable at death, as might be purchased of the society on the day of division, with a single premium, equal to each member's share of the money surplus. Having thus described, as briefly and as generally as the complicated character of the subject would permit, the method of ascertaining the nature of, and the mode of distributing, the surplus in this society, a few additional remarks will put the meeting in possession of the peculiar advantages which the Mutual Society offers to the public. It will be readily perceived that a surplus can only be produced *out of the assurance premiums contributed by the members*, and only in consequence of those premiums being higher that the absolute nature or risk of their assurances required. The result of a few years' actual experience may show that these premiums have been calculated at a higher rate than the real premiums need necessarily have been.

1. Because the mortality amongst the members has been less than was originally anticipated. 2. Because a greater rate of interest has been actually realised, than was at first assumed. 3. Because the expense of managing the society has really fallen short of the amount allowed; and generally, from many other similarly unexpected causes. Could the occurrence of all these circumstances have been previously ascertained,—or even, if assumed, could their regular annual recurrence be relied on for the future, there can be no doubt but that the simplest and most equitable plan for any life office to adopt would be either at once to reduce the premiums to the real ascertained scale, or else (which practically amounts to the same thing) give to each policy as much new assurance, or bonus, as the extra and unnecessary premiums paid by each person would purchase. But as these facts cannot be previously ascertained, nor their regular recurrence be relied on, it is obvious that any society, either adding to its policies, or reducing for the future its annual premiums, on any such hypothesis, renders itself liable to the objections previously noticed (as made by Mr. Morgan), admits the possibility of abrupt and violent transitions in the apparent condition of the society, and gives away (even on the assumption of future regularity) at once to the assurer, all the additions or profits he can ever expect to receive—in a word, such a plan anticipates the future profits, and at once divides them. There are in London existing societies, which are are types of both these plans; and they are often brought forward as fair subjects for comparison with the Mutual Society, but in neither case is it fair to institute such a comparison; and the directors would guard the members against the feeling of disappointment which might naturally arise, when comparing the flattering additions made, or the large reductions in premium offered, by such societies, with what has been done by this society, in an equal period of time. It is to be borne in mind, that the societies here alluded to have already ready reached their limit, nor can their members expect any further reduction in premium, or any larger addition to their policies, even admitting that such benefits remain without further fluctuation. It has been asserted that is impossible to foretel, with exact accuracy, how far the premiums taken from the members will perform the functions required from them, but the experience of the past is a sufficient guide within assigned limits, as to what may for the future be expected—thus, although it is scarcely possible to tell before hand exactly how much of every premium will be required for the absolute risk, and how much will be profit, yet it may be fairly assumed, that the real risk will be contained within the limits of the given premium, neither exceeding a certain sum nor falling below a certain sum. This degree of uncertainty as regards the future, however, wholly disappears, when we come to investigate the past operations of a society for some years back; and it is easy then to determine, with the most perfect accuracy, how much of every past premium has been necessary to the risk incurred, and how much consequently has been the excess or profit. This, then, divested of all complexities, is the scheme of the Mutual Society. Every member is credited with the sum of his *past premiums paid in excess*, and a corresponding amount of assurance granted him at death. The operation of this scheme will be to give to the members a more gradual and more regular increase to their policies, to render that addition less liable to violent fluctuations, and to make it in the end far more considerable than it could possibly have been by any other mode.

Before they conclude this report, the directors will once again remind the meeting that, however satisfactory the progress of the Mutual may have been during the past year, its position as a society cannot be properly maintained, nor its sphere of usefulness enlarged, without the active and zealous co-operation of its members. At the outset of its career, it could hardly be expected that a young and untried society, with a novel plan, should meet with the warm advocacy of those who had not inquired into the nature of that plan, nor as yet witnessed its successful operation. Many there were who, having confidence in the assertions of its founders, and possessed of a sufficient degree of moral courage to venture to enroll *themselves* amongst its members, felt, nevertheless, a diffidence in urging their friends and families to follow their example. But as long before this time, the progress and fair working of the society, must have convinced even the most sceptical, and have removed doubt and hesitation from every mind, it is strongly urged upon the members, that they will be conferring no ordinary advantage upon their families and friends, by inducing them to join this society. Many, amongst the higher and middle ranks of life, have up to this time neglected to perform the great social duty of providing for their young and dependent families, and to many would the recommendation be indeed a blessing. How many bitter reflections, and how many self accusations, might be spared to the dying man, on half uttered reproaches by a destitute family, over his newly raised grave, might be avoided by the timely exhibition of a little self denial and prudent foresight, while in health and the enjoyment of life. No individual here present can be ignorant of the great value which attaches to a life assurance, and no one, who has listened attentively to this report, can, for one moment, hesitate to recommend this society.

Mr. NOAKES asked, if the report would be printed and circulated, which he thought very desirable?—Mr. LITTLE asked, if, in the accounts of the assets, they had taken them at the market price, as they were all aware that there had been considerable fluctuation in the Government securities this year?—Mr. HARDY said, that the funds had been valued on the same principles as heretofore observed, and that the value was this year nearly that of the market price.

The CHAIRMAN observed, that as no proprietor seemed to make an observation, he presumed they were all satisfied with the very flourishing state of the institution, as described in the report. (Hear, hear.) Before they parted, however, he would make a few remarks:—First, it gave him increased pleasure to meet them on that occasion, because, in addition to having an increased surplus, they had also a diminished expenditure, which were demonstrated, as far as any calculation could be made, and, he might say, mathematically. That report had proved to them, that there was no necessity for a paid-up capital, for the purpose of carying on their society. (Hear, hear.) Only let them look, for one moment, at the state of comparison between this society and the Equitable, at the same age. At the end of 12 years the Equitable, that great society, of which so much was heard in all quarters, had but 734 assurances, whilst the Mutual had 882 existing policies; their amount of assurances was but 230,000*l.*, against that of the Mutual, which was 610,000*l.*—(applause); their income was also but 9000*l.* a year, whilst theirs was 20,000*l.* In addition to having done in that short interval more than was expected, they had maintained a steady increase in the annual surplus, which, at that moment, left a divisible sum of 48,000*l.* for the members, which was reckoned below the market price. Was it not better to divide that surplus amongst themselves,

than to give it to a number of proprietors that were not wanted? (Hear, hear.) After calling for a million of capital, they would not get all that 48,000*l.*, but they would be permitted in other societies to have one-fifth, and, perhaps, one-third, in some instances; but was it not more sensible, and was it not more business like, to act as they (the Mutual) did, and take it all to themselves? Then, how was it distributed? They paid a certain sum of money every year for the purpose of assuring a given amount at their decease, and the instant they assured there was so much capital for their widows and children, if death happened. Nothing else was taken from them, but a trifling sum to cover the risks they incurred, which was also granted to them the instant it was paid—that was to say, the excess, whatever it might be, went to their assurances. That was the actual principle of the society, and they must bear in mind, it was not by means of agency. Every member of this society must be looked upon as an agent in himself; because, by the accumulation of the general profits, his own assurance would be augmented till his death; therefore, for what purpose should they pay 5 per cent. to a solicitor for getting them policies? (Hear, hear.) Some of them, for instance, in the Law Life Assurance, received 300*l.* a year for such purposes. But, by the principle of this society, they get back their 48,000*l.*, and then, minus the expense of management, everything they ever parted with for the society. Now, what was this expense of management? In the year 1839, whilst their amount of assurances was 300,000*l.*, the expense of the office, including directors and officers, was but 2400*l.* In the year 1845, whilst the total sum assured was 600,000*l.*, the expenses of management were still 2400*l.* (Applause.) That was the vital principle, which showed how their money came back, and that nothing was taken from the property, either by the directors or the members; therefore nothing but a national bankruptcy could hinder their getting their money back again. They might, certainly, lose by the medical men taking bad lives, or the directors not being competent; but, as that was not the case, and their only wish was to bring them the largest profit possible, to be divided amongst the members, they might rest satisfied on that subject. He would counsel the members, not to look to the personal application of the directors, and rest supine themselves, for they must all act individually. (Hear, hear.) The benefits of the principle would be seen by the following case:—A young person, only 21, insured for 500*l.*, and he paid 9*l.* 12s. 6d., and altogether 138*l.* 8s.; now, if he had died, his widow would have received 604*l.*, after 12 years' membership; and should he die by the last day of next December, he would receive an increase of 13*l.*, or a bonus larger by so much than the sum contributed. There was a good profit. A young man, who had paid them 9*l.* a year, whilst the increase under his policies was 13*l.* 12s. (Hear, hear.) Why, in nine years more, he would receive back every sixpence he had paid into the society; but, if the present extraordinary rate of success continued, it might be in six years. He alluded to his prediction, that, after about 20 years' standing, this society, in which a man had insured for 1000*l.*, and paid 500*l.*, would pay back to his family 1500*l.* (Applause.)

The interest of the money was only taken by the society for the working expenses, and they got back the sum assured, and premium. Now, they had heard of a young life; he would take an older one, being 10. A gentleman of 35 insured for 1500*l.*; he paid last year 43*l.* What was his increased, or new, bonus? Why, 54*l.* Surely, that was a good property, when a man was paying less than he received every year; and they had got his assurance beyond his 1500*l.* (Applause.) He would take a still older life, one at 42. He insured for 2000*l.*, and paid 71*l.* 13s. 4d.; the increased surplus to him was 74*l.* 2s. He thought such proofs would easily demonstrate the national benefit of an institution of this description, and the world was now beginning to see it, for it was now very general for societies to write up "mutual" in glaring characters, whilst their other proprietary cognomen was dimly seen at bottom. (Laughter.) But still they were not of the mutual principle like them; they gave back all they could certainly, but they kept a large capital in hand, and their shares were at a considerable premium. He would again allude to the members using their influence individually, for it was the best kind of agency, but they would not let them start as such till they brought enough to pay their expenses. On this principle they had started at Gloucester, which they found worked so well that they did the same at Leamington and Warwick, since which they had got to Liverpool and Bath; what was the result of this regulation? The revenue which the society received from them was 1500*l.* (Applause.) Was it then too much to say that this society was, after 12 years' experience as good; but he would recall that, the best he meant, of any founded upon the mutual principle? (Hear, hear.) He felt the more interested in the success of the society, as he was with it when it started, as it were, from nothing. They proceeded, as if upon the principle of a person walking down Cheapside, and seizing upon the first 100 stout and healthy men he met, persuading them to insure their own lives for 1000*l.* each, and they would never want a sixpence. (Laughter.) The directors had provided amongst them a guarantee fund against anything that might arise, but they had not been called upon to pay a farthing of that guarantee fund since they thus laid the foundation of the society, by the union of a few individuals. He then predicted, that at the end of 10 years, they would be perfectly safe; and now, after 12 years, they had their own capital untouched, and were now beginning to lend on mortgage; many in that room might live to see them with 100,000*l.* of the society's money out on mortgage. He mentioned these things, to impress upon them the value of the institution, and with the hope that every one would do his duty to the society individually, because, as it was often said, "what is every body's business is nobody's," and by looking for the directors to run about here and there to find members, they would themselves do nothing, for, in a short time, their influence would come to an end at some particular point, whilst each member was, as it were, the centre of a new circle. (Applause.) He thanked them for coming together so much more numerously on this occasion, and for their attention to his remarks; and, in conclusion, hoped they would urge all their friends to become members of the institution.

Mr. MOORE then moved, and Mr. NOAKES seconded—"That the report be printed, and circulated amongst the members;" which was passed unanimously.

Mr. NOVELLO had been astonished that so many persons had neglected the benefits of life assurance; but he found it was because they insured too highly. If a young man would insure from 300*l.* to 500*l.*, at an annual expense of 6*l.* or 9*l.*, it would not be a great inconvenience, and a sensible benefit to himself and family. (Hear, hear.)

Mr. SIMPSON said he had assured since 1830 in the Eagle for 1000*l.*, and all that he had got at present was 31*l.* added to his policy.

Mr. NOVELLO proposed—"That the thanks of the meeting be given to the worthy chairman, for his conduct at all times, and for his kind explanation of the principles of life assurance." (Hear, hear.)

Sir CHAS. DOUGLAS seconded the motion, which was passed by acclamation.

The CHAIRMAN said, he hoped to have succeeded in drawing and confining the attention of a committee of the House of Commons to life assurance, but it was made to include also bubble companies; when he would have undertaken to prove, that any man, who had got 5*l.* to spare, would not be performing his duty to his family, if he did not insure his life. There were not more than 100,000 persons insured out of the millions in this city. (Hear, hear.) He hoped the day would shortly come, when the Legislature would take up the subject of life assurance, when the effect of a public inquiry would be to prove that no other test but the mutual principle should be applied to such institutions, from its being more advantageous than all others. (Hear, hear.)

Col. ROBINSON alluded to the zeal, ability, and perseverance of their actuary (Mr. Hardy), which he had often witnessed as one of the directors. He would, therefore, propose—"That the thanks of the meeting be given to Mr. Hardy, the actuary." (Applause.)

Mr. JAMES BURCHELL seconded this motion, and

Sir CHARLES DOUGLAS, in putting the question, stated that he had been a witness at the board, for five or six years, of the ability and perseverance of their able actuary (Mr. Hardy); and that for his part he confessed that it gave him additional confidence in the society, from having Mr. Hardy at the board.

The motion was passed by acclamation.

Mr. HARDY said, he thanked the meeting for the kind manner in which they had passed that vote of thanks and confidence in him; and he felt deeply indebted to those gentlemen, who had so handsomely proposed and seconded it. It was a source of sincere gratification to him, to find that his efforts to give satisfaction to the society were attended with success. Allusions had been made to the report; and it was a source of unalloyed pleasure to him, to find that it had been received with satisfaction by the members. It was rather more lengthy than he could have wished; but he was sure the meeting would pardon that fault, as it was occasioned by the anxiety of the directors to explain, in the clearest and fullest manner, to the members, not only the condition and prospects of the society, but also the principles on which the divisions were made, and thus put the public not only in possession of the figures and results, but of the reasons which guided the directors in every part of their proceedings. (Applause.)

Mr. ROWSELL moved a vote of thanks to the directors, which was seconded, and passed unanimously.

Sir CHARLES DOUGLAS returned thanks, when the meeting separated.

THE COAL TRADE—OPENING THE THAMES JUNCTION RAILWAY.—The directors of the Eastern Counties Railway have certified to the Board of Trade their intention of opening the Thames Junction Railway, the branch from Stratford to the River Thames, for goods traffic, on the 2d of March, provided the line should be approved of by the Inspector-General. The line is near completion—the engineers, labourers, &c. being now busily engaged in forming a junction with the main line, just above the branch or junction of the Cambridge line. It runs close by the river Lea, on the eastern side of the the Thames, where extensive quays have been erected for the prompt unloading of the colliers, the traffic, it is understood, being intended to be principally devoted to coals. It passes under the Stratford and Plaistow high-roads and the different bridges being lower than the usual standard, an alteration will have to be made in the height of the locomotive power now in their service.

HUNGERFORD MARKET COMPANY.—The 100*l.* share was sold at the mart, on Thursday, by Messrs. Brown and Roberts, for 55*l.* The other fetched the same price.

PROGRESS OF THE ATMOSPHERIC SYSTEM IN FRANCE.

Our readers are aware that the sum of 1,800,000 fr. was allotted by the Chamber to the Minister of Public Works, for the purpose of investigating the various plans for atmospheric propulsion, and testing the several principles. On this subject M. Arnollet, Engineur-en-Chief de Ponts et Chaussés, has written a very spirited letter to the Minister, in which he states—"When the Chamber allotted the sum for the purpose of investigating the best method of employing the atmospheric system on railways, you stated in the Tribune (House of Commons), that you wished to employ that sum to procure on this important question all the information possible: and that it was the duty of France to strive and throw a light to other nations, instead of receiving it from them." He then proceeds to give his opinion as to the system—"A steam-engine of 120-horse power, according to the English system, works well once per hour, and that only for five minutes, to draw a train, which passes on a tube of 1500 feet. In my system, on the contrary, an engine of 10-horse power, or 12 times less than the English machine, will work 12 times longer, or during the whole day. So as to cause the vacuum in a reservoir, and, according to my system, in placing the communication of the empty reservoir with the tube when the train comes up, the reservoir instantly absorbs the air of the tube in which the vacuum will act, to draw the train the same as if it came from the great engine. On horizontal lines, of 1500 ft. in length, my system will only require a quarter of the necessary power compared with the English system, in supposing there is no loss or entry of air, and the expense would not be half a *centime*, or the tenth part of a halfpenny per ton; and per kilometre, at the rate of 45 miles per hour, which would be one-quarter less than by the locomotive system, and that at the rate of 24 to 30 miles only. The hardness of the tube has been proved not to be imperative, as it only requires to stop the escape of the air, which is very easy to be prevented, as it can only operate within or without. It is necessary, however, that the materials of which the tubes are made, notwithstanding the split, or grooves, along the whole length, must be strong enough to prevent the pressure of the exterior air, making them collapse. The means I should adopt would vary according to the materials they are made of, but they are always easy to be accomplished, whatever may be the construction of the tubes, so as to obtain the resistance required by the pressure; as, according to the method I propose, this pressure will never be higher than one-half atmosphere, and very often will not exceed one-quarter. Among the different materials that can be used for the formation of tubes, wood of every description can be adopted if well saturated, or covered on the outside and interior with pitch and grease, after having been rendered solidified and impervious by the process of Sir William Burnett, Payne and Loder, Kyan's (Anti-Dry-Rot Company), Margary, or others, whose inventions are now known, and well established throughout the world. I do not think, therefore, that there can be any objection to this system, which will be attended with four-fifths less expense in the atmospheric tube, and three-fourths in fixed engines."

Hediard's System.—A railway intended for experiments on this principle has just been completed at St. Ouen, its length being 1800 metres, or rather more than 1¼ mile—the propelling tube is laid down to the length of 656 yds., resting upon transverse sleepers; Hediards' *principle* is the same as Clegg and Samuda's, the only difference being in the method of closing the longitudinal valve. There can be no doubt it must eventually be owing to the far greater superiority of valve, than those at present in use, that the great powers of atmospheric propulsion and its superiority in point of economy must be developed; leakage, and expense of wear and tear, form at present two enormous items in the annual expenses. On the two parallel edges of the longitudinal groove of the tube, two plates of tempered steel are arranged, forming two curved springs, the convex surfaces abutting against each other, and pressing sufficiently close to keep the tube air tight, the connecting rod from the piston forms a narrow ellipse, with very fine edges, passing up between the steel springs, to allow them to close as close to it on both sides as possible; the propelling tubes are 15 in. in diameter, and cast in lengths of three-yards, and weigh 11¾ cwts. each; the air pump has 30-in. stroke, and is 51-in. diameter, worked by a 50-horse power high pressure engine; its cylinder, 31½-in. diameter, with 70-in. stroke, give 32 strokes per minute. Experiments are being continued on the line, which will enable its inventor to introduce many modifications to lessen the friction, which is certainly at present great, and make the action of the spring, to prevent the admission of air more perfect.

Messrs. Jullien and Valerio's System.—In the system adopted by these gentlemen, there is a propulsion tube similar to the others between the rails, but without any longitudinal opening. The piston, in passing along, acts on a series of pinions, which are connected with rollers outside; these rollers communciate motion to the trains by means of bands of iron properly arranged, and a model, on a small scale, which the inventors have had constructed, works perfectly satisfactorily; notwithstanding which, engineers consider that there are many objections to the principle, which can only be answered by full size machinery. One question arises, will the pressure of the pinions against the openings necessary to admit the air *behind* the piston, always be sufficient to keep that portion of the tube *before* it hermetically sealed?—another is, will the action of *small* (comparatively) pinions on *large* rollers have sufficiently power to carry a tram up inclines?—and, on this question, it is considered that, on even a slight incline, a continual slipping will take place, destroying any of the advantages which might have been expected, and disarranging the whole system. An opinion also appears to prevail that so ruinous will be the friction that nothing like the necessary speed could be obtained, even on levels or curves. It appears, however, that the inventors have never intended the plan for the great lines of railway—it seems they are quite aware of the enormous difficulties they would have to overcome—but have considered that, from its economy in construction, it would be most applicable as branches to those lines leading to villages and rural districts in the immediate vicinity of their routes, where great speed is by no means required, and where safety and cheapness of transit is the all-important consideration. As to the cost it is estimated at 11,000*l.* per mile, with two tubes, which is quite equal to the cost of Clegg and Samuda's; but its great advantages would rest in its working, which could be carried on at much less cost, and the wear and tear so little, that, consequently, expensive maintenance and repairs would be avoided.

LARGE CASTING FOR A WAR STEAMER.—On Monday last, a large condensor, required for two 800-horse engines, in a large war steamer, was sent from Bowling Foundry. This condensor is in one casting, weighing 6 tons, 13 cwt., 4 qrs. and 24 lbs., the largest casting ever known. No fewer than four houses have, we understand, previously tried to accomplish this extraordinary work, but without success; this triumph was reserved for a workman in the service of the Bowling Company.

PAYNE'S PATENT PROCESS FOR THE PRESERVATION AND IMPROVEMENT OF TIMBER, &c.—PAYNE and LODER beg to invite the attention of Engineers, Railway Companies, Architects, and others, to the ABOVE PROCESS, and to state that they are prepared to ERECT the necessary APPARATUS in any part of the United Kingdom, where the quantity is sufficiently large to cover the outlay of its removal.—Further particulars can be obtained at WHITEHALL WHARF, CANNON-ROW, WESTMINSTER, or at their other stations— 39

FLEETWOOD-ON-WYRE, LANCASHIRE, UNION WHARF, SOUTHAMPTON, and
WISBEACH, CAMBRIDGESHIRE, GUILDFORD, SURREY.

PILBROW'S ATMOSPHERIC RAILWAY AND CANAL PROPULSION COMPANY.—Completely Registered.

DIRECTORS.

The Right Hon. the Earl of ESSEX, Chairman.

The Right Hon. the Earl of Bessborough | Lieutenant-Colonel Gilliess
G. B. Bolton, Esq. | F. J. Lambert, Esq. 40

Dr. J. G. Hewlett, Resident Director

Directors of Railway and Canal Companies are informed that this company is now READY to GRANT LICENSES FOR, or SUPERINTEND the LAYING DOWN of LINES on PILBROW'S ATMOSPHERIC PRINCIPLE.

The advantages offered by this method of propulsion are cheapness, increased speed, and safety, over every other existing system, whether locomotive or atmospheric. Leakage is entirely avoided, the tube being buried. Also an immense saving, as well in the construction as in the working of lines, not requiring tunnelling, levelling, or embankment. The surface requires but little more preparation than for the common roads.

The application of this method of propulsion to Canal Navigation will be attended with incalculable advantages.

Its superiority, efficiency, and simplicity, will be demonstrated, and explanations given, at the offices of the company, 6, King William-street, London-bridge.

CHARLES COLLINS, Secretary.

UNIVERSAL GAS LIGHT COMPANY.
Capital £100,000, in 5000 shares, of £20 per share.—Deposit 2s. per share, in accordance with the Act.—(Provisionally Registered.)

Names of the Working Committee, in whose hands the affairs of the Company are placed until fully registered.

William Stiles, Esq. | Professor Ryan, M.D., LL.D.
Captain Kenyon | Robert Nicholson, Esq.
Henry Francis, Esq., patentee | Dominique Causse, Esq.
Joseph Peplow, Esq. | Henry Ault, Esq.
Charles Brooke, Esq. | John Kissick, Esq. 41

SOLICITOR—J. F. W. Fesenmeyer, Esq.

BANKERS—Sir Claude Scott, Bart., and Co.

This company is formed for the purpose of carrying out, and bringing into general use, an invention (secured by letters patent) for an improved manufacture of gas, of a superior quality, and at much less expense than the usual cost, by an apparatus so simple in construction, and so compendious in form, as to be available in any building or situation where the ordinary supplies of gas are not accessible.

Full details in prospectus, which may be had at the offices of the company, 159, Drury-lane, with forms of application for shares, and where may be seen the apparatus at work, and the brilliancy of the gas exemplified. Mr. William Nicholson, Secretary, to whom must be made all communications, post free.

UNIVERSAL GAS LIGHT COMPANY.—CONTRACTS TAKEN for LIGHTING UP, with a SUPERIOR GAS, and at a REDUCED RATE—towns, villages, lighthouses, dockyards, hospitals, theatres, public offices, manufactories, printing-offices, prisons, barracks, railway stations, asylums, schools, and other large buildings, where the ordinary gas is not accessible.—Letters to be addressed to Mr. William Nicholson, secretary, 159, Drury-lane. 42

ATMOSPHERIC RAILWAYS.
TO RAILWAY COMPANIES, ENGINEERS, MANUFACTURERS, IRONMASTERS, AND TO ALL OTHERS WHOM IT MAY CONCERN.

NOTICE is hereby given, that the Atmospheric System, included in Pinkus's First and Second Patents, of 1834 and 1836, and which is now about to be adopted on the Croydon line, is, nevertheless (although practicable), but a crude and imperfect one of Mr. Pinkus's several systems, and involves an unnecessarily large outlay of capital in the construction, and an unnecessarily heavy expenditure in the annual working thereof; whilst, by Pinkus's new Systems, only about one-half the expense is constructing, and one-half in the working and annual maintenance, is incurred. The former long valve is dispensed with, and the loss by leakage thereof prevented—one line of pipe suffices for a double line of railway; each train is made to move under the influence of two stationary engines, at the termini of a section, simultaneously, by which means the amount of motive power is reduced by one-half, yet affording the required amount of propelling power. The stationary engines work constantly, husbanding power at intervals, when trains are not moving, thus inducing much economy. The propelling main is reduced in size, to one-half the capacity required by the former system; yet affording the same amount of propelling power. Trains may be more frequently moved, and without danger. And by a further system (being the Atmospheric Locomotive), one line of pipe suffices for a double line of railway; the train, as before-mentioned, moves under the influence of two stationary engines at the termini of a section simultaneously; the *column of air in the pipe does not move with the velocity of the load;* the immense loss of power consequent upon friction of air moving rapidly in the tube, is thus avoided; the quantity of air acted upon for an equal amount of propelling power, is only a fifth part of the quantity necessary by the former system—equal flexibility with the common steam locomotive system is obtained, the locomotive atmospheric engines being capable of moving forwards and backwards, as by the steam locomotives, more frequent trains may be moved without loss of time, and without waiting for the re-evhaustion of the propelling tube, *the power of the locomotive is greatly increased on inclined planes, without enlargin gthe tube, and perfect safety, from the possibility of a train moving off the rails is secured.*—These are advantages which Pinkus's other first system, about to be used on the Croydon Line, does not possess.

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Communications addressed to Mr. Alfred Gregory, Sec. pro tem.

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